SwitchBlade® x3112

AT-SBx3112 Chassis
AT-SBx31CFC Fabric Control Card
AT-SBx31XZ4 XFP Line Card
AT-SBx31GP24 PoE Line Card
AT-SBx3161 System Power Supply
AT-SBx3165 PoE Power Supply
AT-SBx31FAN Tray

Installation Guide

Allied Telesis™

Electrical Safety and Emissions Standards

This product meets the following standards.

U.S. Federal Communications Commission
Radiated Energy
Note: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Note: Modifications or changes not expressly approved of by the manufacturer or the FCC, can void your right to operate this equipment. |

Industry Canada
This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada. |

European Union Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment
This Allied Telesis RoHS-compliant product conforms to the European Union Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment.   Allied Telesis ensures RoHS conformance by requiring supplier Declarations of Conformity, monitoring incoming materials, and maintaining manufacturing process controls.

RFI Emissions   FCC Class A, EN55022 Class A, EN61000-3-2, EN61000-3-3, VCCI Class A, C-TICK, CE

Warning: In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Immunity   EN55024

Electrical Safety   EN60950-1 (TUV), UL 60950-1 ($_C$UL$_{US}$)

Laser Safety   EN60825

Translated Safety Statements

Important: The ⌔ indicates that a translation of the safety statement is available in a PDF document titled "Translated Safety Statements" on our web site at **http://www.alliedtelesis.com/support/software**.

Refer to "Where to Find Web-based Guides" on page 13 to navigate to the product documents for the SwitchBlade x3112

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Preface

This guide provides the hardware installation instructions for your SwitchBlade x3112 switch. This preface contains the following sections:

❒ "Safety Symbols Used in this Document" on page 12
❒ "Where to Find Web-based Guides" on page 13
❒ "Contacting Allied Telesis" on page 14
❒ "Management Software Updates" on page 14

Safety Symbols Used in this Document

This document uses the safety symbols defined in Table 1.

Table 1. Safety Symbols

Symbol	Meaning	Description
⚠	Caution	Performing or omitting a specific action may result in equipment damage or loss of data.
⚡	Warning	Performing or omitting a specific action may result in electrical shock.

Where to Find Web-based Guides

The installation and user guides are available for all Allied Telesis products in portable document format (PDF) on our web site. Switchblade x3112 Management Software updates are also available. Go to **http://www.alliedtelesis.com/support/software/**.

Enter your hardware product model in the **Search by Product Name** field; for example, enter AT-SBx3112. You can view the documents online or download them onto your local workstation or server.

Contacting Allied Telesis

This section provides Allied Telesis contact information for technical support as well as sales or corporate information.

Online Support You can request technical support online by accessing the Allied Telesis Knowledge Base from the following web site: **www.alliedtelesis.com/support**. You can use the Knowledge Base to submit questions to our technical support staff and review answers to previously asked questions.

Email and Telephone Support For Technical Support via email or telephone, refer to the Allied Telesis web site: **www.alliedtelesis.com**. Select your country from the list displayed on the website. Then select the appropriate menu tab.

Warranty For the SwitchBlade x3112 hardware warranty information, refer to the Allied Telesis web site at **www.alliedtelesis.com/warranty**.

Returning Products Products for return or repair must first be assigned a Return Materials Authorization (RMA) number. A product sent to Allied Telesis without a RMA number will be returned to the sender at the sender's expense. For instructions on how to obtain an RMA number, go to the Support section on our web site at **www.alliedtelesis.com**.

For Sales or Corporate Information You can contact Allied Telesis for sales or corporate information at our web site: www.alliedtelesis.com. Select your country from the list displayed on the website. Then select the appropriate menu tab.

Management Software Updates New releases of the Switchblade x3112 Management Software for our managed products are available on our Allied Telesis web site at **http://www.alliedtelesis.com/support/software/.**

Go to "Where to Find Web-based Guides" on page 13 for instructions on navigating to this information.

Chapter 1
Overview

This chapter provides descriptions of the SwitchBlade x3112 chassis, line cards, power supplies and fan tray and contains the following sections:

Introduction

The SwitchBlade x3112 Switch is a modular enterprise access edge chassis scalable for GB and 10G Ethernet applications. It features redundant fabric switching architecture, copper and fiber line cards and system and PoE power supplies. The switch supports up to 240 GE ports or up to 40 10GE ports and can provide up to 2400W of PoE+ power; for example, 30W of Class 4 (IEEE 802.1at) PoE+ power can be provided for up to 80 ports.

See Table 1 for the SwitchBlade x3112 Switch components.

Table 1.   SwitchBlade x3112 Switch Components

Component	Description	Reference
AT-SBx3112 Chassis	Rack mountable chassis with 12 line card slots, 2 System power supply slots, 2 PoE power supply slots, and 1 fan tray slot	page 17
AT-SBx31CFC Fabric Control Card	Fabric switch controller	page 20
AT-SBx31GP24 PoE Line Card	24 port 10/100/1000Base-T PoE Ethernet line card	page 29
AT-SBx31XZ4 XFP Line Card	4 port 10GE XFP Ethernet line card	page 36
AT-SBx3161 System Power Supply	AC power input, with system output voltage of 12VDC and output power of 1200 W	page 38
AT-SBx3165 PoE Power Supply	AC power input, with PoE output voltage of 56VDC and output power of 1200 W	page 40
AT-SBx31FAN Tray	Contains 4 fans, 3 temperature sensors, and a controller board	page 42

AT-SBx3112 Chassis

The AT-SBx3112 Chassis has a modular design that is seven Rack Units (RU's) high. It contains a high-speed backplane which has the capacity for the following:

❏ Up to two switching fabric line cards

❏ Up to ten Ethernet line cards

❏ Up to two AC system power supplies

❏ Up to two PoE power supplies

❏ One fan tray

Four individual A/C PSU plugs are provided on the rear panel for the power supply slot.

The chassis provides high resiliency with a passive backplane, capacity for ten line cards, redundant controller cards and power supplies The chassis supports up to 40 ports at 10 Gbps of full-duplex data exchange or 400 Gbps switching throughput capacity.

All of the controllers, line cards, power supplies and the fan tray are hot-swappable.

Figure 1 and Figure 2 on page 18 show the front and rear views of the AT-SBx3112 Chassis as shipped from the factory. The AT-SBx31FAN Tray is pre-installed in the chassis at the factory.
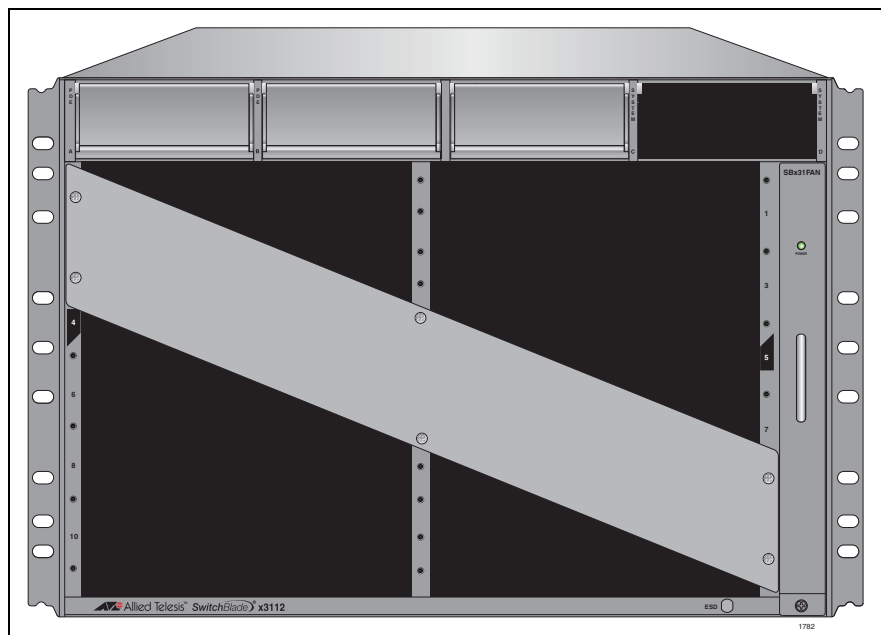
Figure 1 Front View of the AT-SBx3112 Chassis
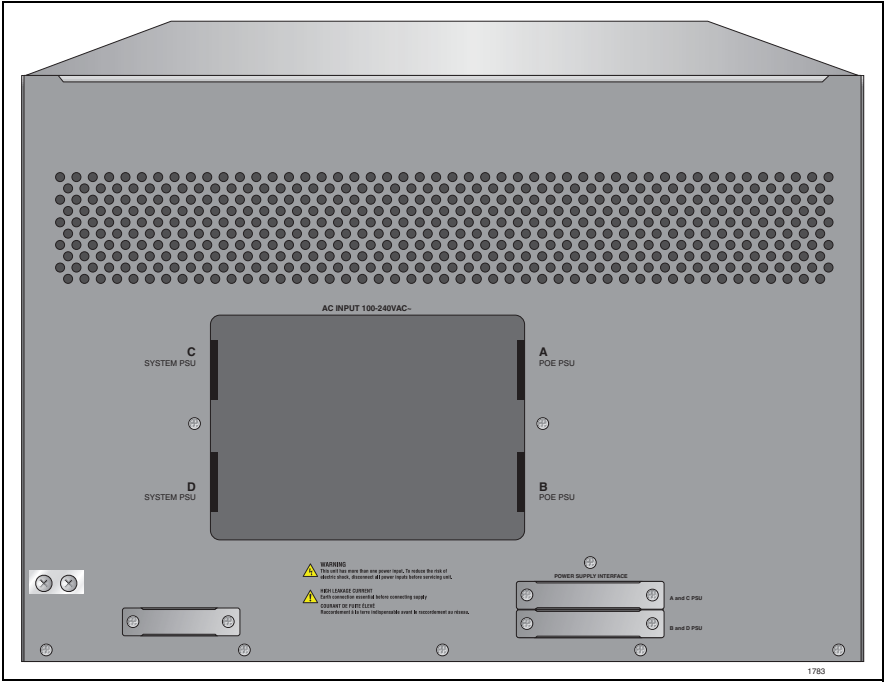
Figure 2 Rear View of the AT-SBx3112 Chassis

AT-SBx3112 Chassis Slots

The AT-SBx3112 Chassis has four power supply slots, 12 line card slots, and one fan tray slot. The slot configuration of the AT-SBx3112 Chassis is displayed in Figure 3 and the components available for each slot are described in Table 2 on page 19.
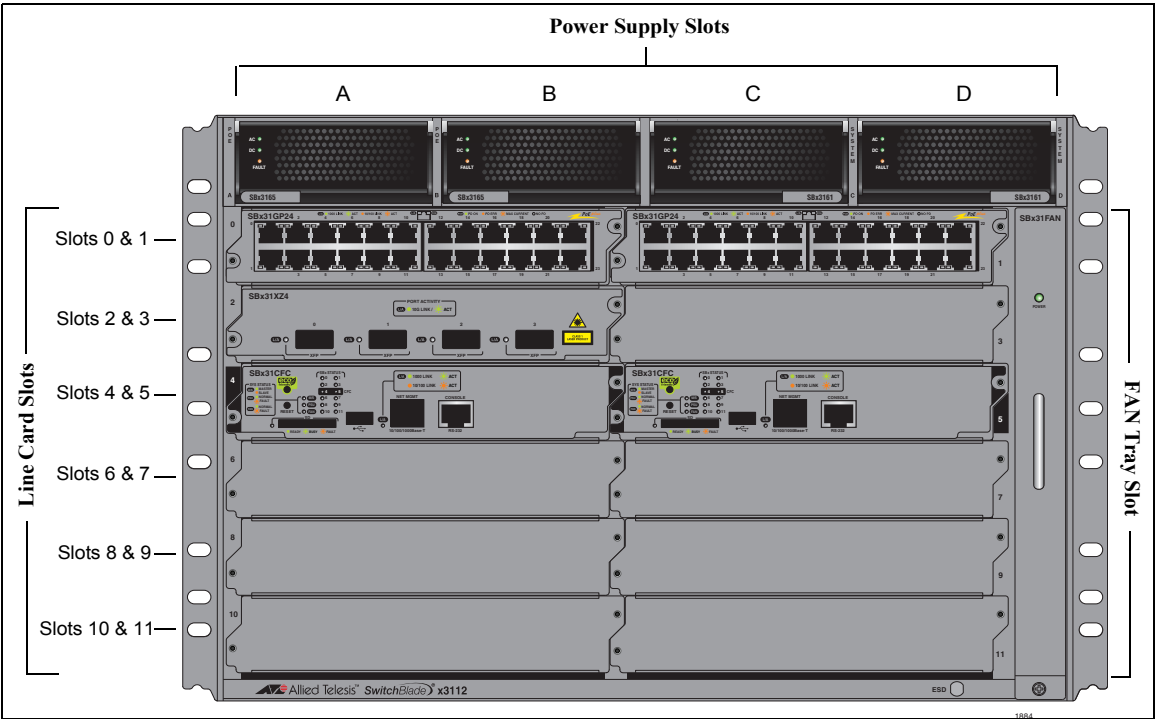
Figure 3 AT-SBx3112 Chassis Slots

Table 2.   AT-SBx3112 Chassis Slots

Slot	Line Cards/Power Supplies
A and B	These slots are for the primary and redundant AT-SBx3165 PoE Power Supplies. Each slot can accommodate one power supply.
C and D	These slots are for the primary and redundant AT-SBx3161 System Power Supplies. Each slot can accommodate one power supply.
4 and 5	These slots are for the primary and redundant AT-SBx31CFC Fabric Control Cards. Each slot can accommodate one card.
0 to 3, 6 to 11	These slots are for the AT-SBx31GP24, and the AT-SBx31XZ4 Line Cards. Each slot can accommodate one card.

AT-SBx31CFC Fabric Control Card

The AT-SBx31CFC Fabric Control Card provides two functions: the central switching fabric between all the Ethernet line cards and the central controller for management and control of the chassis.

Note
One AT-SBx31CFC supports up to 200 Gbps of bidirectional Ethernet traffic. When two AT-SBx31CFC Fabric Control Cards are installed, the switching load of the network traffic is shared between the switching fabric circuitry on each of the line cards resulting in a potential system throughput of 400 Gbps.

The Switchblade x3112 Management Software resides on the AT-SBx31CFC Fabric Control Card which monitors and configures the line cards via the controller circuitry. Either one or two AT-SBx31CFC Fabric Control Cards may be installed yielding a non-redundant or redundant controller configuration respectively.
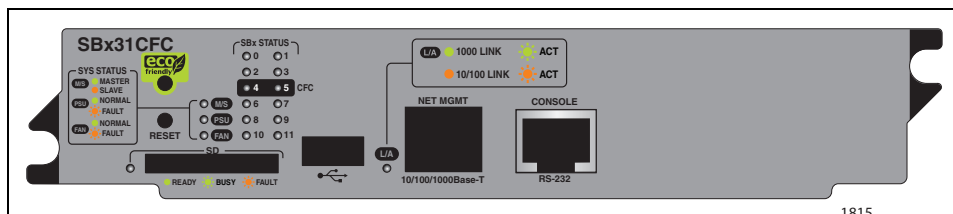
Figure 4 AT-SBx31CFC Fabric Control Card

Note
The AT-SBx31CFC Fabric Control Card can only be installed in slots 4 or 5 of the AT-SBx3112 Chassis.

Note
The CLI mnemonic for the AT-SBx31CFC Fabric Control Card in the Switchblade x3112 Management Software is "CFC200".

AT-SBx31CFC Fabric Control Card Features

The AT-SBx31CFC Fabric Control Card supports the following features:

❏ Supports up to 40 ports at 10 Gbps of full-duplex data exchange or 400 Gbps switching throughput capacity with two AT-SBx31CFC Fabric Control Cards installed.

❏ Supports a non-redundant switching configuration with one AT-SBx31CFC Fabric Control Card installed. This configuration is non-blocking if the Ethernet traffic on each line card does not exceed a line rate of 20 Gbps.

❏ Supports a redundant, non-blocking switching configuration with two AT-SBx31CFC Fabric Control Cards installed.

❏ Centralized LED for status of all line cards installed in the AT-SBx3112 Chassis.

❏ Supports an eco-friendly button for enabling/disabling port and status LEDs on all line cards.

❏ Provides a system reset switch.

❏ Supports an SD Card slot for data storage and retrieval.

❏ Provides a USB port for data storage and retrieval on a USB device.

❏ Supports a remote management via a 10/100/1000 Base-T network management port.

❏ Supports local management via an RS-232 CONSOLE port.

❏ Front loading access is provided for servicing.

❏ Supports a hot swappable design for all modules.

Status LEDs

The AT-SBx31CFC Fabric Control Card has two types of status LEDs on the front panel:

❏ "System Status LEDs" , next

❏ "SBx STATUS LEDs" on page 23

System Status LEDs

The System Status LEDs on the AT-SBx31CFC Fabric Control Card display general status information about the management system status, the power supplies, and the Fan Tray. These LEDs are displayed in Figure 5 and described in Table 3 on page 22.
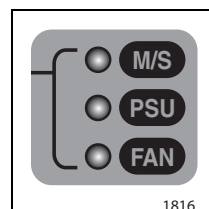
Figure 5 System Status LEDs

Table 3.   System Status LED Descriptions

LED	State	Description
M/S	Solid Green	The AT-SBx31CFC Fabric Control Card is the active management controller.
	Solid Amber	The AT-SBx31CFC Fabric Control Card is the inactive management controller.
	Flashing Amber	The AT-SBx31CFC Fabric Control Card is 'Out of Sync' or disabled.
PSU	Solid Green	All configured power supplies are operating properly.
	Flashing Amber	A FAULT condition has occurred where one or more of the configured power supplies are operating outside of the normal temperature or voltage ranges. Check the individual power supply LEDs to determine which power supply has a fault condition.
FAN	Solid Green	The Fan Tray is operating properly.
	Flashing Amber	A FAULT condition has occurred where one or more fans are not operating at the proper speed.

Note
All the System Status LEDs on the inactive AT-SBx31CFC Fabric Control Card do not illuminate unless this card assumes the role of the active controller.

SBx STATUS LEDs

The SBx STATUS LEDs on the AT-SBx31CFC Fabric Control Card display the general operating states of the Ethernet line cards and the management cards in slots 0 through 11 of the chassis. For the location of the slots, see Table 3 on page 18. There is one LED per slot. These LEDs are displayed in Figure 6 and described in Table 4.
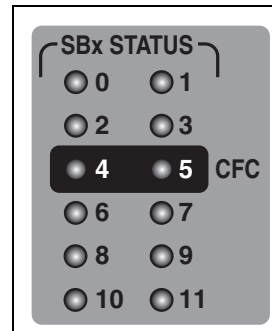
Figure 6 SBx STATUS LEDs

Table 4.   SBx STATUS LED Description on the Active AT-SBx31CFC Fabric Control Card

LEDs	State	Description
0 to 11	Off	Indicates that the slot is empty.
	Solid Green	Indicates that the line card is operating normally.
	Flashing Green	Indicates that the line card is booting up, in test, or loading a configuration file.
	Solid Amber	Indicates that the line card is in an off-line, reset, or disabled state. You can remove the line card from the chassis while it is in this state.
	Flashing Amber	Indicates that the line card is reporting a failure condition. Use the CLI commands to obtain the specific problem.

Note
The SBx STATUS LEDs on the inactive AT-SBx31CFC Fabric Control Card do not illuminate until the line card assumes the role of active controller.

eco-friendly Button

The eco-friendly button on the AT-SBx31CFC Fabric Control Card front panel is used to turn off the LEDs on the line cards.This reduces the overall power consumption of the switch. It is displayed in Figure 7. You may want to turn off the LEDs when you are not using them to monitor the port status on the line card front panels.

With the LEDs are turned off, all of the LEDs in the chassis are affected except for the M/S LED on the active AT-SBx31CFC Fabric Control Card which is always illuminated.

The eco-friendly button is also used for a lamp test, which is initiated each time the button is pushed. The lamp test consists of LEDs flashing in alternating colors for 3 seconds.

Figure 7 eco-friendly Button and Reset Button

RESET Button

You can use the RESET button to reset the controller and switch fabric circuitry on the AT-SBx31CFC Fabric Control Card.This button is displayed in Figure 7. Push the button only in the unlikely event that the Switchblade x3112 Management Software is not responsive to CLI commands or status requests. Depending on your configuration, you may initiate a short interruption in the flow of network traffic through the switch when you press the button.

If you press the RESET button with only one AT-SBx31CFC Fabric Control Card installed, which is the active controller, all of the Ethernet line cards are reset by the AT-SBx31CFC Fabric Control Card as part of its boot up process.

⚠️ **Caution**

When the RESET button is pressed with only one AT-SBx31CFC Fabric Control Card installed, the Ethernet network traffic flow through the switch is interrupted for up to two minutes while the AT-SBx31CFC and Ethernet line cards reboot.

If you press the RESET button with two AT-SBx31CFC Fabric Control Cards installed, the role of the active controller is "swapped" with the inactive controller. This means that the inactive controller becomes the

active controller and the active controller becomes the inactive or standby controller. During this process, the switch management function is swapped to the new active controller. In this case, the inactive AT-SBx31CFC becomes active immediately, and consequently, the Ethernet line cards are not affected or reset.

⚠️ **Caution**

With two AT-SBx31CFC Fabric Control Cards installed, the switching fabric circuitry on each line card is shared. When you press the RESET button, the Ethernet network traffic flow through the switch is limited to 200 Gbps for up to two minutes. This is the time required for the inactive AT-SBx31CFC Fabric Control Card to reboot and for its switching fabric circuitry to become available again for switching network traffic.

Note

The RESET switch is specifically provided for resetting the AT-SBx31CFC Fabric Control Card. If you want to swap the controller function between the active and standby AT-SBx31CFC Fabric Control Cards, Allied Telesis recommends that you use the SWAP commands provided in the Switchblade x3112 Management Software. Refer the to the Software Reference for SwitchBlade® x3100 Series Switches on the ATI web site for specific information. Go to "Where to Find Web-based Guides" on page 13 for information about how to navigate to this document.

Network Management Port

The Network Management (NET MGMT) port is a standard Ethernet, Fast Ethernet, and Gigabit Ethernet port. See Figure 8. This port provides for remote management of the SwitchBlade x3112 Switch when you connect it to a device on your network. If it is available in the chassis, you can connect it directly to one of the copper ports on an Ethernet line card.
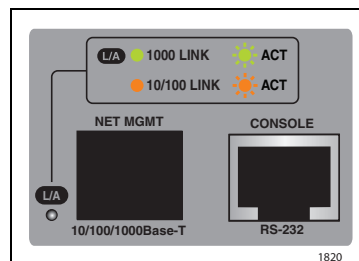
Figure 8 NET MGMT and CONSOLE Ports

The NET MGMT port is a standard RJ-45 8-pin connector and can operate at 10, 100, or 1000 Mbps in either half- or full-duplex mode. The cable requirements for this port can be found in the table "Cable Requirements for the 10/100/1000Base-T Management Port" on page 104. For the port

pinouts, refer to "Connectors and Port Pinouts" on page 102.
The default setting for the Management port is Auto-Negotiation with Auto
MDI/MDI-X. At the default setting, the port, which is IEEE 802.3u
compliant, sets its speed and duplex mode automatically with Auto-
Negotiation. You can disable Auto-Negotiation and set the speed and
duplex mode manually.

The wiring configuration of the port is set automatically with
Auto MDI/MDI-X to MDI or MDI-X, depending on the wiring configuration
of the end node. This allows you to use a straight-through twisted-pair
cable regardless of the wiring configuration of the port on the network
device. The Auto MDI/MDI-X feature is only available when the port is
using Auto-Negotiation. If the Auto-Negotiation feature is disabled with the
Switchblade x3112 Management Software, the port defaults to the MDI-X
setting.

NET MGMT LED

The Network Management (NET MGMT) port on the AT-SBx31CFC
Fabric Control Card has one Status LED as displayed in Figure 8 and
described in Table 5.

Table 5.   NET MGMT port LED Description

LED	State	Description
L/A	Solid Green	The port has a valid 1000 Mbps link.
	Flashing Green	The port is transmitting or receiving data at 1000 Mbps.
	Solid Amber	The port has a valid 100 or 10 Mbps link.
	Flashing Amber	The port is transmitting or receiving data at 100 or 10 Mbps.

Console (RS-232) Port

You use this port for local management with a console or a PC with a
terminal emulation program. See Figure 8. This port does not require the
AT-SBx31CFC Fabric Control Card to have an Internet Protocol (IP)
address and is referred to as local or out-of-band management because it
is not conducted over a network.

When initially configuring your SwitchBlade x3112 Switch, you first
connect to this port with an RS-232 Serial Management cable. The cable
is provided with the AT-SBx31CFC Fabric Control Card.

For instructions on how to start a local management session, refer to
Chapter 2, "Starting a Local Management Session" on page 87 or refer to
the Software Reference for SwitchBlade® x3100 Series Switches on the
ATI web site. Go to "Where to Find Web-based Guides" on page 13 for
information about how to navigate to this document.

USB Port   The USB slot is an interface designed for temporary storage of configuration files on a memory stick. This interface is presently unsupported by the Switchblade x3112 Management Software and will be available in future software releases.

SD Card Slot   The SD slot for a secure digital memory (SD) card is displayed in Figure 9 and is used in the following situations:

❒ Storing backup copies of the master configuration file on the AT-SBx31CFC Fabric Control Card. You can maintain a library of past configuration files of a chassis so that you can return a unit to a previous configuration.

❒ Transferring master configuration files between chassis - You can configure units that are to have similar configurations by transferring the master configuration file with a secure digital memory card.
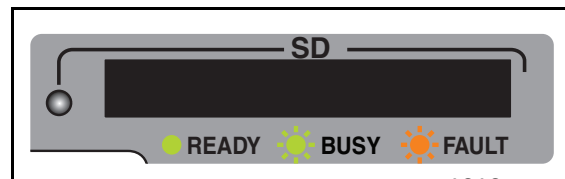
Figure 9 SD Card Slot and LED

An SD card is optional. The AT-SBx31CFC Fabric Control Card can operate without a memory card.

The following SD flash memory cards are officially supported in the first release.

❒ SanDisk 2GB Flash card

❒ SanDisk 4GB SDHC Flash card

Note
Others brands can be used but are not guaranteed to work.

For ordering information, contact your Allied Telesis sales representative or visit our web site.

SD Status LED   The SD Status LED on the AT-SBx31CFC Fabric Control Card is
displayed in Figure 9 on page 27 and described in Table 6.

Table 6.   SD Status LED Descriptions

LEDs	State	Description
SD	Off	The SD slot is empty or the SD card is improperly installed.
	Solid Green	The SD Card is properly installed in the slot and is ready. You can safely remove the SC Card in this state.
	Flashing Green	The AT-SBx31CFC Fabric Control Card is retrieving or storing data on the SD Card.
	Flashing Amber	The AT-SBx31CFC Fabric Control Card has detected a problem with the SD card. The line card may be installed improperly in the slot or there may be a problem with the line card itself.

⚠️ **Caution**

A loss of data may occur if you remove your SD card when the SD
status LED is flashing green.

Before removing the card, use the DEACTIVATE MEDIA in the
Switchblade x3112 Management Software. Wait for the SD status
LED to turn off before removing the card.

AT-SBx31GP24 PoE Line Card

The AT-SBx31GP24 PoE Line Card provides 24 10/100/1000 Base-T Ethernet switching capability with Power over Ethernet (PoE). All ports are RJ-45 connectors. See Figure 10.
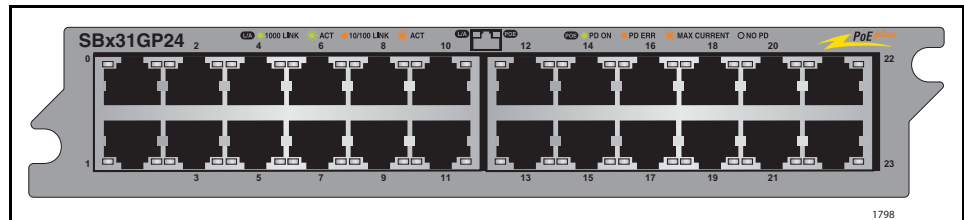
Figure 10 AT-SBx31GP24 PoE Line Card

In addition, the AT-SBx31GP24 has the following features:

❐ Up to 30W of Class 4 (IEEE 802.1at) PoE+ power for each port

❐ Store and Forward switching supports line rates of:

– 1,480,000 pps (1000 Mbps)

– 148,000 pps (100 Mbps)

– 14,800 pps (10 Mbps)

❐ Jumbo frames supported up to 10 KB

❐ Non-blocking full-wire speed switching on all packet sizes

❐ MAC address table capacity of up to 16K addresses with automatic aging

❐ Flow control in full-duplex operation

❐ Back pressure in half-duplex operation

❐ Auto MDI/MDI-X.

❐ Port status LEDs adjacent to each port

❐ Hot swappable

Note
The AT-SBx31GP24 PoE Line Card can only be installed in slots 0 through 3 or 6 through 11 in the AT-SBx3112 Chassis.

Note
The CLI mnemonic for the AT-SBx31GP24 PoE Line Card in the Switchblade x3112 Management Software is "GE24POE".

Connector Type   The ports are 8-pin RJ-45 connectors that use four pins at 10 or 100 Mbps and all eight pins at 1000 Mbps. For the pin assignments, refer to "RJ-45 Twisted Pair Port Pinouts" on page 78.

Speed   A port's speed can be 10, 100, or 1000 Mbps. The speed can be set automatically through Auto-Negotiation, the default setting, or manually with the Switchblade x3112 Management Software.

Note
To operate at 1000 Mbps, a twisted-pair port is set to Auto - Negotiation. You cannot set the speed of a twisted-pair port to 1000 Mbps manually.

Duplex Mode   A twisted-pair port can operate in either half- or full-duplex mode. (Full-duplex mode is the only mode available when a port is operating at 1000 Mbps.) The twisted-pair ports are IEEE 802.3u-compliant and Auto-Negotiate the duplex mode setting.

You can disable Auto-Negotiation on one or all of the switch ports so that you can set the duplex mode manually through the Switchblade x3112 Management Software.

Note
In order for a switch port to successfully Auto-Negotiate its duplex mode with a 10 or 100 Mbps end node, the end node should also be configured for Auto-Negotiation. Otherwise, a duplex mode mismatch can occur. A switch port using Auto-Negotiation defaults to half-duplex if it detects that the end node is not using Auto-Negotiation. This results in a mismatch if the end node is operating at a fixed duplex mode of full-duplex.

To avoid this problem when connecting an end node with a fixed duplex mode of full-duplex to a switch port, use the Switchblade x3112 Management Software to disable Auto-Negotiation on the port and set the port speed and duplex mode manually.

Maximum Distance   The ports have a maximum operating distance of 100 meters (328 feet).

Cable Type   The cabling requirements for a 10/100/1000Base-T port are:

❒ For 10 Mbps operation: Standard TIA/EIA 568-B-compliant Category 3 or better shielded or unshielded cabling with 100 ohm impedance and a frequency of 16 MHz.

❒ For 100 Mbps operation: Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.

❒ For 1000 Mbps operation: Standard TIA/EIA 568-A-compliant Category 5 or TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.

Auto MDI/ MDI-X   The twisted-pair ports on the switch are IEEE 802.3ab compliant and feature Auto MDI/MDI-X. This feature, available when a port's speed and duplex mode are set through Auto-Negotiation, automatically configures a switch port to MDI or MDI-X depending on the wiring configuration of the port on the end node. This allows you to connect any network device to a port on the switch using a straight-through twisted-pair cable.

If Auto-Negotiation is disabled on a port and the speed and duplex mode are set manually, the Auto MDI/MDI-X feature is also disabled and the port's wiring configuration defaults to the MDI-X setting.

Port Pinouts   Refer to Table 14 on page 102 for the port pinouts when a twisted-pair port operates at 10 or 100 Mbps in the MDI configuration and Table 15 on page 102 for the MDI-X configuration. For port pinouts when a twisted-pair port operates at 1000 Mbps, refer to Table 16 on page 103.

Port LEDs   Each port on the AT-SBx31GP24 PoE Line Card has two status LED as displayed in Figure 11 and described in Table 7.
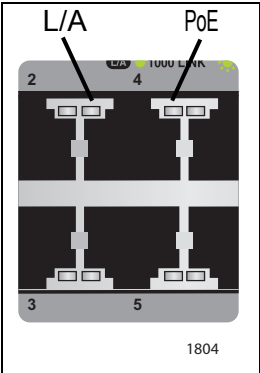
Figure 11 Port LEDs on the AT-SBx31GP24 PoE Line Card

Table 7.   Port LED Descriptions on AT-SBx31GP24 PoE Line Card

LED	State	Description
L/A	Solid Green	The port has a valid 1000 Mbps link.
	Flashing Green	The port is transmitting or receiving data at 1000 Mbps.
	Solid Amber	The port has a valid 100 or 10 Mbps link.
	Flashing Amber	The port is transmitting or receiving data at 100 or 10 Mbps.
PoE	Green	The port detects a Power Device (PD) which is a normal load.
	Amber	The port detects an overload, a terminal short or external forced voltage feeding into the port. The port's PoE power is shutdown.
	Flashing Amber	The overall power budget for the switch is exceeded with the powered device connected to this port.
	Off	A valid Power Device (PD) is not detected and Power over Ethernet (PoE) power is not being supplied on the port.

AT-SBx31GP24 Power over Ethernet

The twisted-pair ports on the AT-SBx31GP24 PoE Line Card feature Power over Ethernet (PoE). PoE is a mechanism for supplying power to network devices over the same twisted-pair cables used to carry network traffic. This feature can simplify network installation and maintenance by allowing you to use the switch as a central power source for other network devices.

A device that receives its power over an Ethernet cable is called a powered device (PD). Examples of such devices are wireless access points, IP telephones, web cams, and even other Ethernet switches. A PD connected to a port on the switch receives both network traffic and power over the same twisted-pair cable.

The AT-SBx31GP24 automatically determines whether a device connected to a port is a PD or not. A PD has a signature resistor or signature capacitor that the switch can detect over the Ethernet cabling. If the resistor or capacitor is present, the switch assumes that the device is a PD.

A port connected to a network node that is not a PD (that is, a device that receives its power from another power source) functions as a regular Ethernet port, without PoE. The PoE feature remains enabled on the port but no power is delivered to the device.

Power Budgeting

The AT-SBx31GP24 PoE Line Card is capable of providing a maximum of 30W of power per port on all 24 ports for a total power consumption of 720 W, while at the same time furnishing standard 10/100/1000 Mbps Ethernet functionality. See Table 8 on page 34 for the matrix of Class versus power level output and the maximum number of ports.

> **Note**
> The maximum number of PoE ports in the SwitchBlade x3112 Switch is 240 ports.

Table 8.   IEEE802.3at Classes versus AT-SBx31GP24 Power Levels

Class	Usage	Maximum Power Levels Output at the PoE port	Range of Power Levels Available at the PD Input	Maximum # of Ports with 1 PoE PSU (1200 W)	Maximum # of Ports with 2 PoE PSU's (2400 W)
0	Default	15.4W	.044W to 12.95W	77	155
1	Optional	4.0W	0.44W to 3.84W	240	240
2	Optional	7.0W	3.84W to 6.49W	171	240
3	Optional	15.4W	6.49W to 12.95W	77	155
4	Optional	30.0W	12.95W to 25.9W	40	80

The PoE power is supplied to the PoE ports on a first come basis. By default, the highest PoE priority starts from slot 0, port 0 and decreases as the PoE slot/port numbers ascend to the last PoE port.

For example, if you have one AT-SBx3165 PoE Power Supply and two AT-SBx31GP24 PoE Line Cards are installed and 40 Class 4 PDs connected to slot/ports 0/0 through 0/23 and 1/0 through 1/15, they all receive the full 30 W of PoE power or a total of 1200W. If more than 40 PDs are connected, the highest slot/port numbers have a flashing amber or fault condition because all the available PoE power (1200 W) are allocated to the first 39 ports and no additional PoE power is available for the additional PDs.

Note
The PoE port priorities can be reassigned using the port configuration commands in the Switchblade x3112 Management Software. Refer the to the Software Reference for SwitchBlade® x3100 Series Switches on the ATI web site for specific information. Go to "Where to Find Web-based Guides" on page 13 for information about how to navigate to this document.

Implementation

A standard Ethernet twisted-pair cable contains four pairs of strands for a total of eight strands. Network traffic at speeds of 10/100 Mbps requires only four strands (1, 2, 3, and 6), leaving four strands in the cable unused (4, 5, 7, and 8).

Note
1000BASE-T cables carry the network traffic on all eight strands of the Ethernet cable.

The PoE standard, IEEE 802.3at, describes two alternative ways for delivering power to a PD over twisted-pair cabling for 10/100 Mbps ports. Alternative A uses the same strands that carry the network traffic where Alternative B uses the spare strands of the cable. The PoE implementation on the AT-SBx31GP24 PoE Line Card is Alternative A, where power is transmitted over strands 1, 2, 3, and 6.

PDs that comply with the IEEE 802.3at standard typically support both power delivery methods. As a PD is compliant with the standard, it receives its power from the switch while using either a straight or crossover cable. The AT-SBx31GP24 PoE Line Card works with most legacy PDs as long as the device can be powered on pins 1, 2, 3, and 6. A legacy device is a node that was manufactured before the IEEE 802.3at standard was completed and, consequently, may not adhere to the standard. If this is the case, a straight (MDI) cable may be needed to insure that the DC polarity is correct.

AT-SBx31XZ4 XFP Line Card

❏ The AT-SBx31XZ4 XFP Line Card provides 10 GB Ethernet switching capability in the SwitchBlade x3112 Switch. Figure 12 shows the front view of the AT-SBx31XZ4 XFP Line Card. Four XFP transceiver slots are provided for fiber connections to your network. You can use these ports to connect high speed devices, such as servers, to your network or to create a high-speed backbone network between other switches and routers. Figure 13 shows an example of an XFP transceiver.

❏
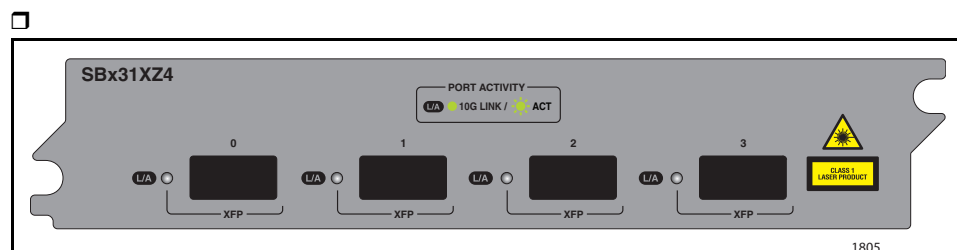
Figure 12 AT-SBx31XZ4 XFP Line Card

Note
The AT-SBx31XZ4 XFP Line Card can only be installed in slots 0 through 3 or 6 through 11 in the AT-SBx3112 Chassis.

Note
The CLI mnemonic for the AT-SBx31XZ4 XFP Line Card in the Switchblade x3112 Management Software is "XE4".
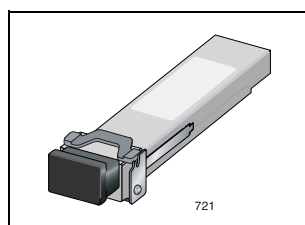
Figure 13 XFP Transceiver

Note
For a list of supported XFP transceivers, contact your Allied Telesis sales representative.

AT-SBx31XZ4 LED

The AT-SBx31XZ4 XFP Line Card has one LED per port as displayed in Figure 14 and described in Table 9 on page 37.
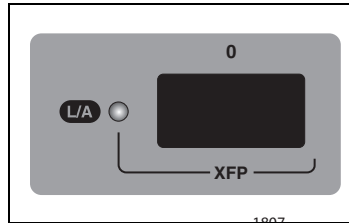
Figure 14 Port LED on the AT-SBx31XZ4 XFP Line Card

Table 9.   Port LED Description on the AT-SBx31XZ4 XFP Line Card

LED	State	Description
L/A	Solid Green	A link has been established between the XFP module and a network device.
	Flashing Green	The XFP module is transmitting or receiving data at 10 GB.
	Off	The slot is empty or the SFP module has not established a link with the network device.

AT-SBx3161 System Power Supply

The AT-SBx3161 System Power Supply provides the power for all components installed in the SwitchBlade x3112 Switch including power for the chassis backplane, two AT-SBx31CFC Fabric Control Cards, up to ten Ethernet line cards and the Fan Tray. See Figure 15. Two slots are available in the AT-SBx3112 Chassis for the installation of a primary and a redundant AT-SBx3161 System Power Supply.

The AT-SBx3161 features a hot swappable design, which allows you to interchange power supplies without causing electronic damage to the system components or the power supply itself.
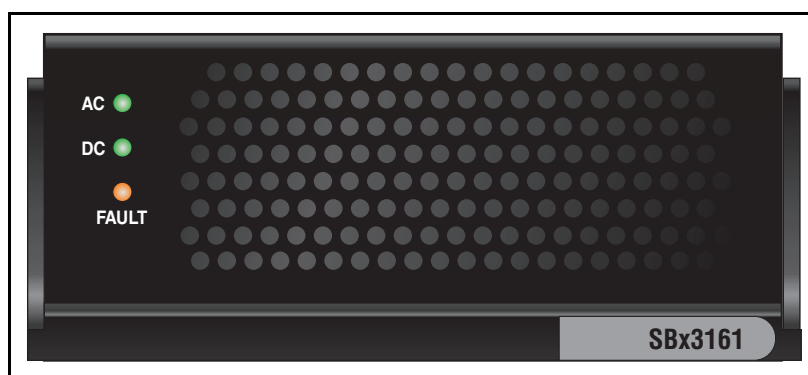
Figure 15 AT-SBx3161 System Power Supply

AT-SBx3161 Status LEDs

The status LEDs on the AT-SBx3161 are displayed in Figure 16 and described in Table 10 on page 39.

Figure 16 Status LEDs on the AT-SBx3161 System Power Supply

Table 10. Status LED Description on the AT-SBx3161 System Power Supply

LED	State	Description
AC	Solid Green	The AC power applied to the system power supply is within the normal operating range.
	Off	The system power supply is not receiving power from the AC power source.
DC	Solid Green	DC power is being supplied to the backplane, line cards and Fan Tray and is within normal specified operating range.
	Off	The DC power from the power supply is not being supplied to the backplane, line cards and fan tray or is not operating within the normal range.
Fault	Solid Amber	A system power supply fault has been detected indicating an under-voltage, or over-temperature condition.
	Off	The system power supply is operating normally or does not have A/C applied to it.

AT-SBx3165 PoE Power Supply

The AT-SBx3165 PoE Power Supply provides the PoE power for the AT-SBx31GP24 PoE Line Cards. The AT-SBx3165 features a hot swappable design, which allows you to interchange power supplies without causing electronic damage to the system components or the power supply itself. The features of the AT-SBx3165 are:

❒ 1200 Watts for PoE power for the ports on the AT-SBx31GP24 PoE Line Card(s)

❒ One AT-SBx3165 PoE Power Supply supports for up to 40 ports maximum connected to Class 4, PoE+ (IEEE 802.3at) power devices

❒ Two AT-SBx3165 PoE Power Supplies support for up to 80 ports maximum connected to Class 4, PoE+ (IEEE 802.3at) power devices

❒ Hot swappable design
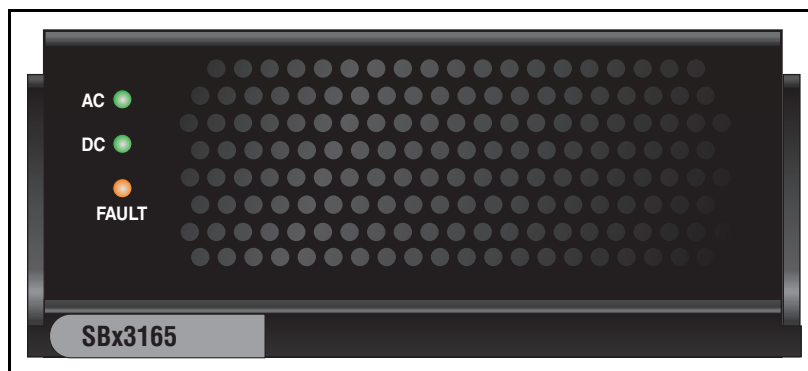
Figure 17 AT-SBx3165 PoE Power Supply

AT-SBx3165 Status LEDs   The status LEDs on the AT-SBx3165 are displayed in Figure 18 and described in Table 11 on page 41.
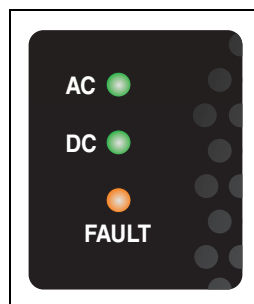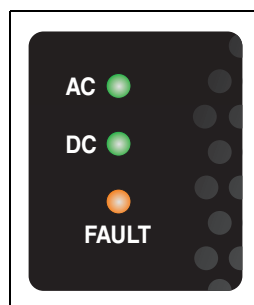

Figure 18 Status LEDs on the AT-SBx3165 PoE Power Supply

Table 11. Status LED Description on the AT-SBx3165 PoE Power Supply

LED	State	Description
AC	Solid Green	The AC power applied to the PoE power supply is within the normal operating range.
	Off	The PoE power supply is not receiving power from the AC power source.
DC	Solid Green	DC power is being supplied to the backplane and PoE line cards and is within normal specified operating range.
	Off	The DC power from the PoE power supply is not being supplied to the backplane and PoE line cards or is not operating within the normal range.
Fault	Solid Amber	A fault in the PoE power supply has been detected indicating an under-voltage, or over-temperature condition.
	Off	The PoE power supply is operating normally or does not have A/C applied to it.

AT-SBx31FAN Tray

The AT-SBx31FAN Tray consists of four fans with speed control and status circuitry. It is a field replaceable assembly that is factory installed and shipped with the AT-SBx3112 Chassis.

The fan tray is initialized by the Switchblade x3112 Management Software running on the AT-SBx31CFC Fabric Control Card. The fan speed is controlled automatically and is adjusted proportional to the internal operating temperature of the switch. When the ambient temperature coming into the fan tray is approximately 20 C, the speed of the fans are their lowest. The fan speed increases to provide additional cooling as the ambient temperature rises, which allows proper operation for the line cards within the chassis.

The AT-SBx31FAN Tray features the following:

❐ Cooling across all twelve chassis line card slots

❐ Quad-fan design for better reliability

❐ Software controlled, temperature speed control for noise control

❐ Hot-swappable design
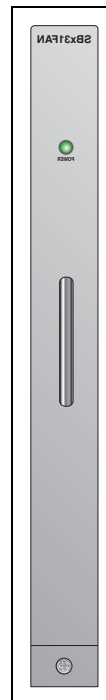
Figure 19 AT-SBx31FAN Tray

Note
The CLI mnemonic for the AT-SBx31FAN Tray in the Switchblade x3112 Management Software is "FM4".

AT-SBx31FAN Tray POWER LED

The AT-SBx31FAN Tray has one POWER LED as displayed in Figure 20 and described in Table 12.
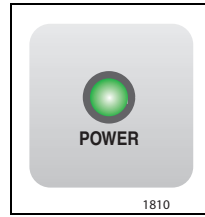
Figure 20 POWER LED on the AT-SBx31FAN Tray

Table 12.   POWER LED on the AT-SBx31FAN Tray

LED	State	Description
Power	Solid Green	The AT-SBx31FAN Tray is receiving power.
	OFF	The AT-SBx31FAN Tray is not receiving power or has failed.

Chapter 2
Installation

This chapter describes how to install the SwitchBlade x3112 in an equipment rack. This chapter contains the following sections:

Reviewing Safety Precautions

Please review the following safety precautions before you begin to install the switch.

> **Note**
> The ✍ indicates that a translation of the safety statement is available on the Allied Telesis website.
>
> Go to **http://www.alliedtelesis.com/support/software/**. Select **Switches** under Product Category and select this product under Product Name. You can view the documents online or download them onto a local workstation or server.

Warning: Class 1 Laser product. ✍ L1

Warning: Do not stare into the laser beam. ✍ L2

Warning: To prevent electric shock, do not remove the cover. No user-serviceable parts inside. This unit contains hazardous voltages and should only be opened by a trained and qualified technician. To avoid the possibility of electric shock, disconnect electric power to the product before connecting or disconnecting the LAN cables. ✍ E1

Warning: Do not work on equipment or cables during periods of lightning activity. ✍ E2

Warning: Class I Equipment. This equipment must be earthed. The power plug must be connected to a properly wired earth ground socket outlet. An improperly wired socket outlet could place hazardous voltages on accessible metal parts. ✍ E4

Pluggable Equipment. The socket outlet shall be installed near the equipment and shall be easily accessible. ✍ E5

Caution: Air vents must not be blocked and must have free access to the room ambient air for cooling. ✍ E6

Warning: Operating Temperature. This product is designed for a maximum ambient temperature of 40° degrees C. ✍ E7

All Countries: Install product in accordance with local and National Electrical Codes. ᴈ E8

Warning: When installing this equipment, always ensure that the frame ground connection is installed first and disconnected last. ᴈ E11

Circuit Overloading: Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of circuits might have on over current protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern. ᴈ E21

Caution: Risk of explosion if battery is replaced by an incorrect type. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Attention: Le remplacement de la batterie par une batterie de type incorrect peut provoquer un danger d'explosion. La remplacer uniquement par une batterie du même type ou de type équivalent recommandée par le constructeur. Les batteries doivent être éliminées conformément aux instructions du constructeur. ᴈ E22

Warning: Mounting of the equipment in the rack should be such that a hazardous condition is not created due to uneven mechanical loading. ᴈ E25

Warning: Remove all metal jewelry, such as rings and watches, before installing or removing a line card from a powered-on chassis. ᴈ E26

Warning: The chassis may be heavy and awkward to lift. Allied Telesis recommends that you get assistance when mounting the chassis in an equipment rack. ᴈ E28

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra). ᴈ E35

⚠ **Caution:** Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised. ✍ E36

⚠ **Warning:** Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuits (e.g., use of power strips). ✍ E37

⚠ **Warning:** To reduce the risk of electric shock, the PoE ports on this product must not connect to cabling that is routed outside the building where this device is located. ✍ E40

⚠ **Warning:** This product may have multiple AC power cords installed. To de-energize this equipment, disconnect all power cords from the device. ✍ E43

⚠ **Caution:** An Energy Hazard exists inside this equipment. Do not insert hands or tools into open chassis slots or sockets. ✍ E44

⚠ **Warning:** This equipment shall be installed in a Restricted Access location. ✍ E45

⚠ **Warning:** High Leakage Current exists in this chassis. Connect external ground wire before connecting AC power supply(s). ✍ E45

Selecting a Site for the SwitchBlade x3112

Observe the following requirements before installing your switch in an equipment rack:

❒ Ensure that the rack is safely secured and that it will not tip over. Devices in a rack should be installed starting at the bottom, with the heavier devices near the bottom of the rack.

❒ The power outlet for the switch should be located near the unit and should be easily accessible.

❒ If the chassis has a system and PoE power supplies installed, the power sources for multiple supplies of the same type should be on different A/C circuits to protect the unit from a power circuit failure.

❒ Use dedicated power circuits or power conditioners to supply reliable electrical power to the network devices.

❒ The site should provide easy access to the ports on the front of the chassis so that you can easily connect and disconnect the network cables, as well as view the unit's LEDs.

❒ Air flow around the unit and through the side and rear vents should be unrestricted.

❒ Do not place objects on top of the switch.

❒ Do not expose the switch to moisture or water.

❒ Ensure that the site is a dust-free environment.

Installing the AT-SBx3112 Chassis

The AT-SBx3112 Chassis is designed for rack mounted installation only. To install the AT-SBx3112 Chassis, perform the following procedures:

❐ "Preparing the Equipment Rack" on page 51

❐ "Unpacking the AT-SBx3112 Chassis" on page 52

❐ "Adjusting the Brackets" on page 53

❐ "Installing the AT-SBx3112 Chassis in Equipment Rack" on page 56

❐ "Installing the Chassis Ground Lug" on page 58

Preparing the Equipment Rack

To prepare for the installation of the SwitchBlade x3112 Switch into your equipment rack, perform the following procedure:

⚠️ **Caution**

Due to its weight, the chassis should be mounted as low as possible in the equipment rack to maximize vertical stability.

1. Reserve 311.1 mm (12.25") of vertical rack space for the installation of the AT-SBx3112 Chassis as shown in Figure 21.

   In addition, do not mount any other equipment within 152.4 mm (6") above this space during installation. This additional vertical space is temporary and allows you enough room to lift and tilt the chassis into its position in the equipment rack without hitting other equipment - see Figure 25 on page 56. When the chassis is installed, this additional space is available for any other equipment that you may install.
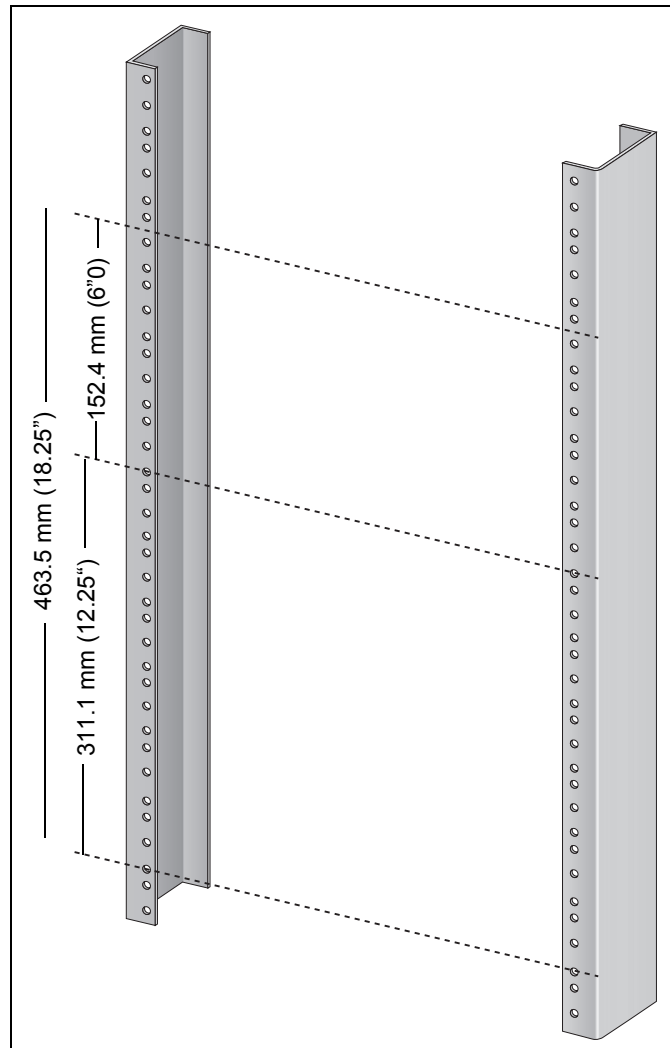
Figure 21. Reserving Vertical Rack Space

2. Identify the lowest 1/2" screw hole pattern on the rack mounting rails within the space reserved for the AT-SBx3112 Chassis. Install one rack mount screw in each vertical rail - at the same height in the top screw hole of the lowest 1/2" hole pattern as displayed in Figure 22. The screws are used to support the chassis while you secure it to the rack.
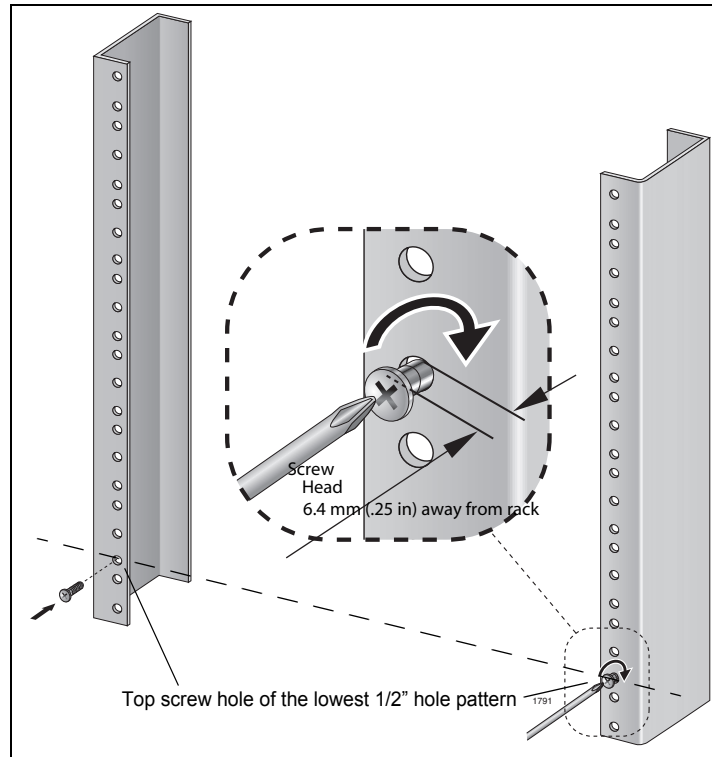
Figure 22. Rack Mounting Hole Locations

Do NOT fully tighten these two screws at this time. The screw heads should protrude from the rack approximately 6.4 mm (.25 in).

Unpacking the AT-SBx3112 Chassis

To unpack the AT-SBx3112 Chassis, perform the following procedure:

1. Remove all components from the shipping package.

Note
Store the packaging material in a safe location. You must use the original shipping material if you need to return the unit to Allied Telesis.

2. Ensure that the following hardware components are included in your package. If any item is missing or damaged, contact your Allied Telesis sales representative for assistance.

  – One AT-SBx3112 Chassis (with pre-installed AT-SBx31FAN Tray and shipping brace)

  – Ten line card blank panels

  – Three power supply blank panels

Adjusting the Brackets

Before installing the AT-SBx3112 Chassis, you need to determine where the horizontal position of the chassis front panel will be relative to the vertical rack rails. The AT-SBx3112 Chassis rack mounting brackets come installed from the factory so that the chassis is flush with the rack rails after installation. See position "A" in Figure 23 on page 54.

You may decide to extend (positions "B" through "E" in Figure 23 on page 54) or recess (position "F" in Figure 24 on page 55) the horizontal position of the chassis relative to the rack mounting rails. You can do this by removing both rack mounting rails and re-attaching them in the appropriate holes on each side of the chassis. The dimension (X) between the front panel and the rack rails is given in Table 13 for each rack mounting bracket position.

Table 13. Front Panel to Rack Rail Dimensions

Figure	Front Panel Position	Dimension X Front Panel to Rack Rail
19	A (Factory Installed - Flush)	3.69 mm (0.145 in)
19	B (Recessed)	-27.39 mm (-1.078 in)
19	C	27.39 mm (1.078 in)
19	D	47.71 mm (1.878 in)
19	E	140.85 mm (5.545 in)
20	F (Reverse Position)	374.16 mm (14.731 in)
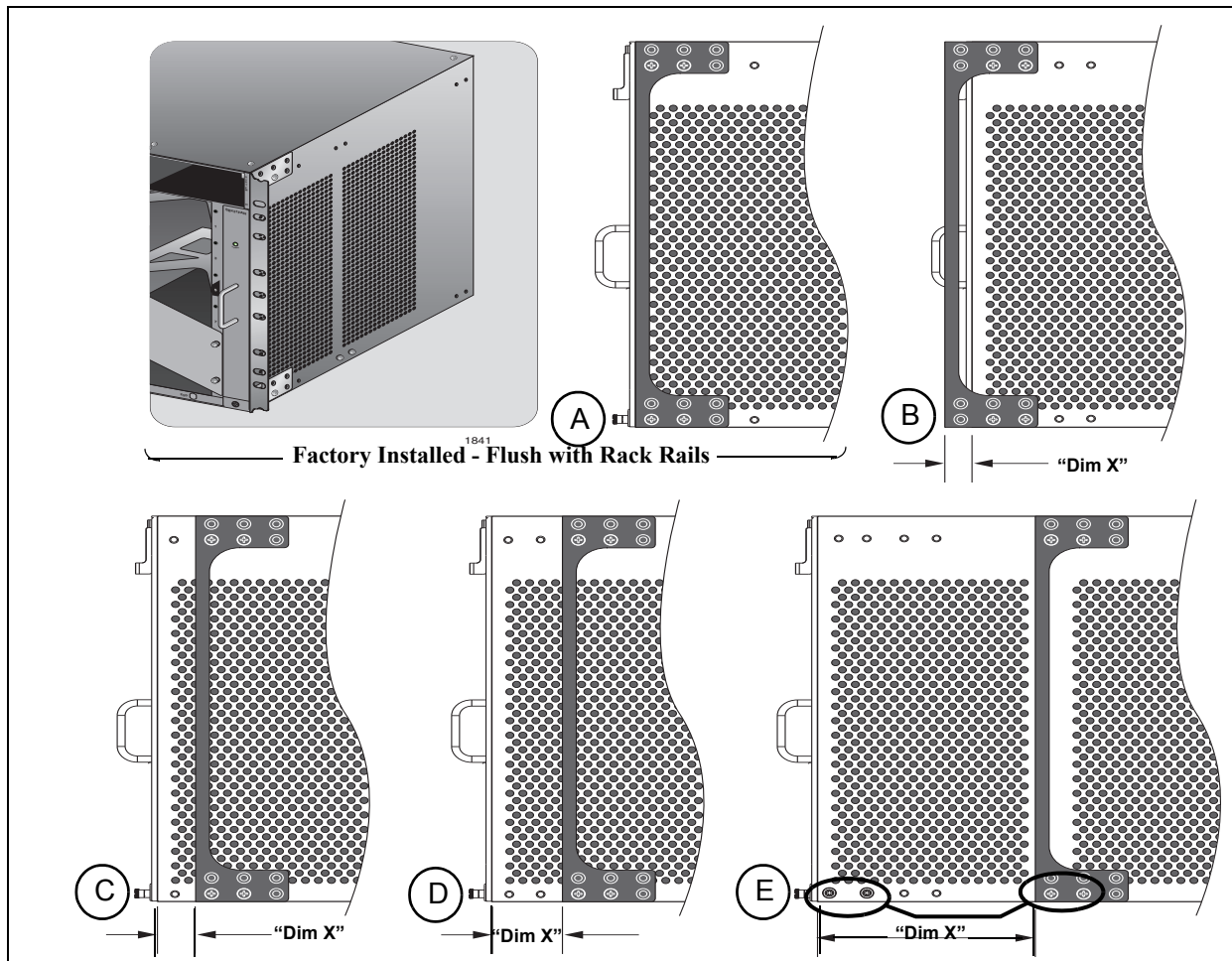
Figure 23. Rack Mounting Bracket Locations

Note

If you elect to mount the rack mount brackets in position "E", the two chassis screws from the bottom-middle section of the chassis must be re-installed in the front where the rack mount bracket screws were originally as displayed in Figure 23.

Front panel facing
towards the rear
of the rack

F
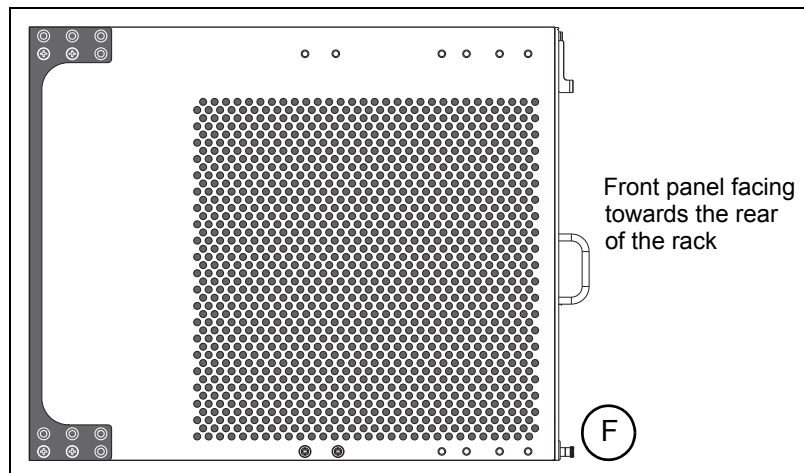
Figure 24. Rack Bracket Locations for Reverse Position of Chassis

Installing the AT-SBx3112 Chassis in Equipment Rack

To install the AT-SBx3112 Chassis into the equipment rack, perform the following procedure:

> **Note**
> Leave the diagonal shipping brace in place until you securely mount the AT-SBx3112 Chassis in the rack. This plate is temporary and prevents any twisting of the chassis frame and mechanical misalignment of the line card slots during shipping and installation.

1. While facing the front of the chassis, tilt the top of the chassis toward you as displayed in Figure 25.

2. Lift the AT-SBx3112 Chassis into the equipment rack and set the bottom of the rack mount brackets firmly on both previously installed rack mount screws. See "Preparing the Equipment Rack" on page 51
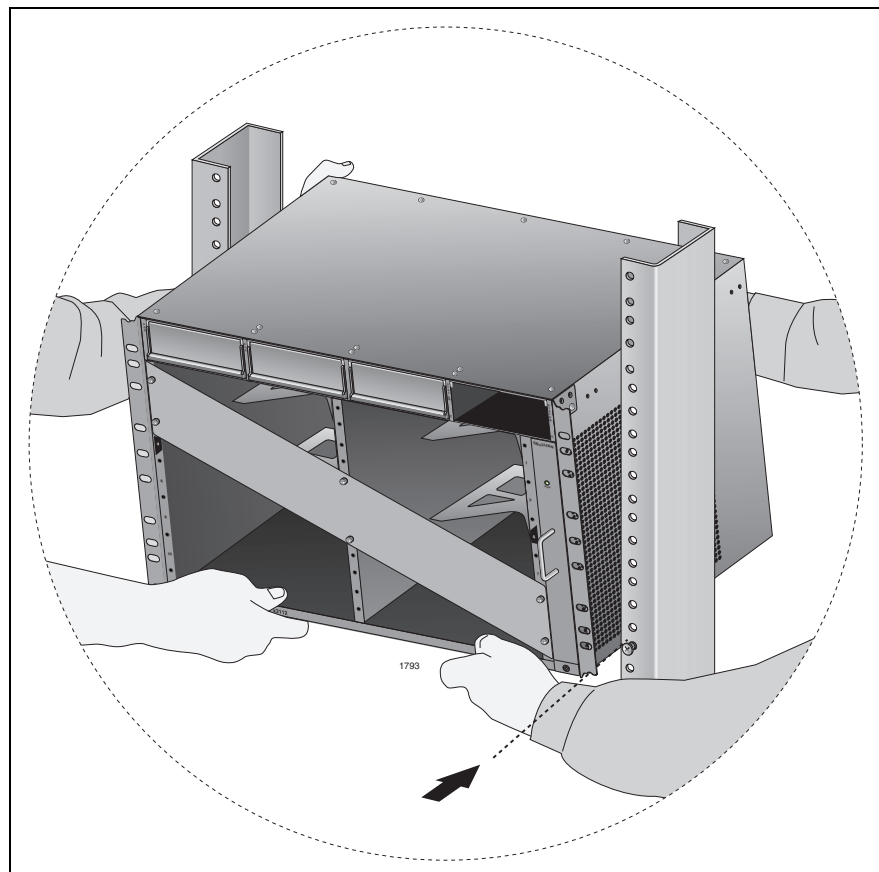
Figure 25. Lifting AT-SBx3112 Chassis into Place

3. With the bottom of the rack mount ears resting on the two rack mount screws, tilt the top of the chassis back until both rackmount brackets are flush and parallel with the vertical rack rails.
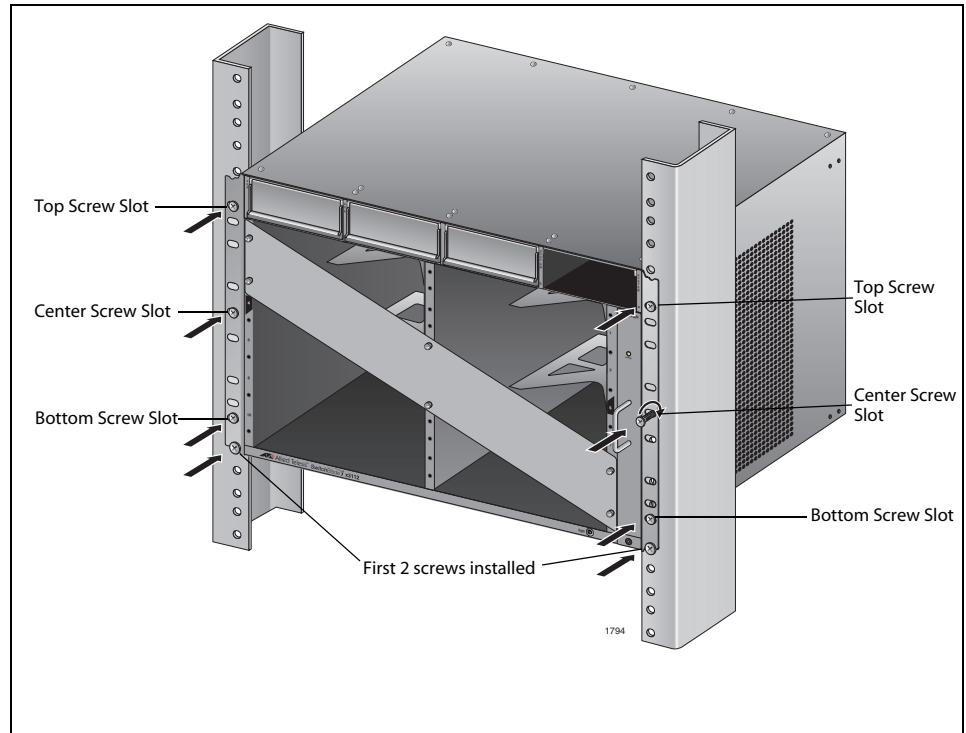
Figure 26. Installing the Rack Mount Screws

4. Install the six remaining rack mount screws (not provided) as displayed in Figure 26 on page 57.

5. Torque all eight rack mount screws to 10 inch-lbs maximum with a # 2 Phillips head screw driver.

6. Remove the front panel shipping brace by removing the six mounting screws holding the shipping brace in place.
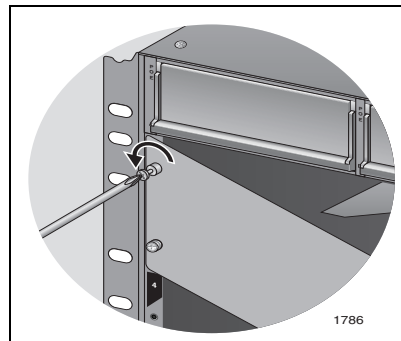
Figure 27. Removing the Front Panel Shipping Brace Screws

Installing the Chassis Ground Lug

A terminal lug is provided with the AT-SBx3112 Chassis to provide a permanent connection to a good earth ground. This permanent connection is required to insure a common ground path is provided for all line cards and power supplies installed in the chassis.

To install the # 10 AWG ground wire, perform the following procedure:

1. Prepare an adequate length of stranded grounding wire (10 AWG) for the ground connection.

2. Strip the grounding wire as shown in Figure 28.
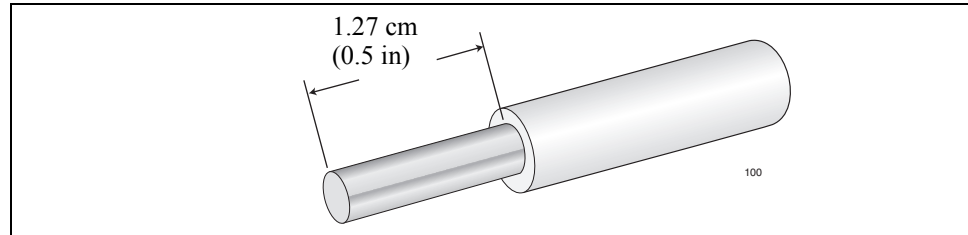
Figure 28. Stripping the Grounding Wire

3. Detach the ground lug that is attached to the chassis by removing the two screws on the rear of the chassis as displayed in Figure 29.
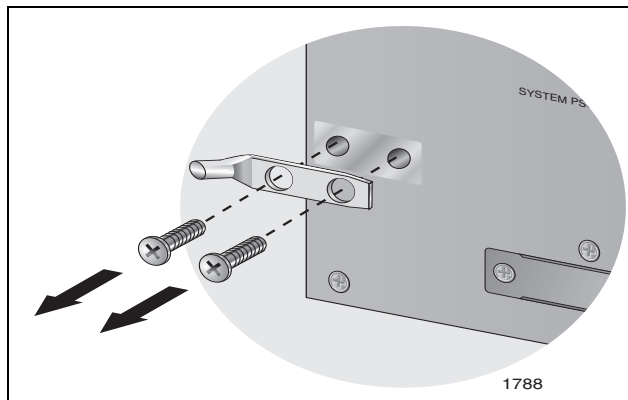
Figure 29. Removing Ground Lug Screws

4. Use a crimping tool to attach the wire to the grounding lug included with the chassis.
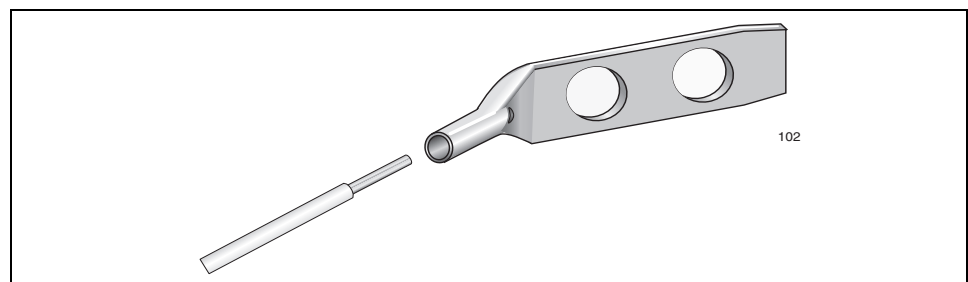
Figure 30. Attaching the Grounding Wire to the Grounding Lug

5. Install the ground lug as displayed in Figure 31.
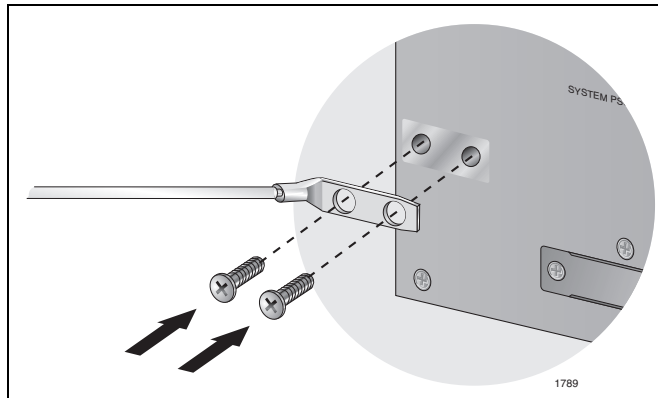
Figure 31. Installing the Ground Lug and Wire

6. Connect opposite end of ground wire to the building protective earth.

Protection Against Electrostatic Discharge (ESD)

Proper ESD protection is required when handling the SwitchBlade x3112 line cards and power supplies. You need properly grounded using wrist or foot straps to eliminate the risk of ESD damage to the equipment.

⚠️ **Caution**
Electrostatic Discharge (ESD) can damage components on the SwitchBlade x3112 line cards and power supplies. Insure that proper ESD procedures are followed during installation.

1. Verify that the chassis is electrically connected to earth ground.

2. Wear an ESD-preventive device such as a foot strap or wrist strap, ensuring that it makes good contact with the user's skin.

   If a foot strap is used, the floor must be ESD conductive.

3. Connect the clip from the ESD-preventative device to the ESD socket on the lower right side of the AT-SBx3112 Chassis front panel or an unpainted surface of the frame or rack as displayed in Figure 32. This ensures that unwanted ESD voltages safely flow to ground.
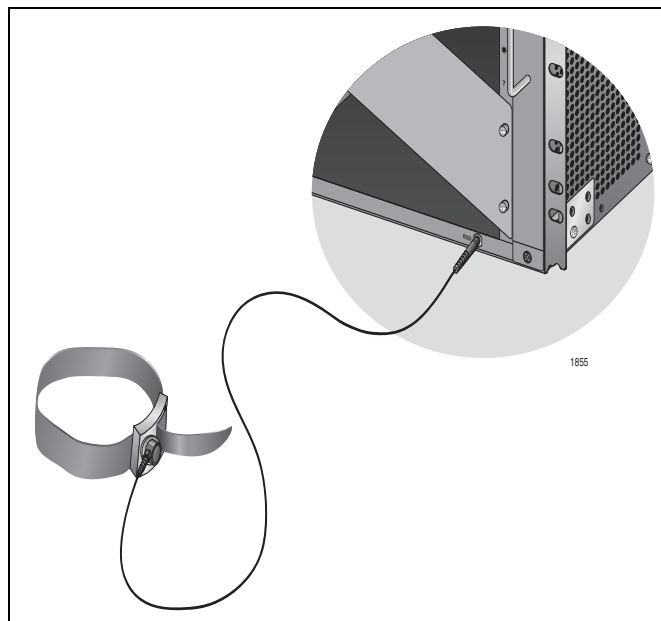
Figure 32. ESD Socket

Installing the AT-SBx3161 System Power Supply

The SwitchBlade x3112 can host up to four power supplies consisting of two AT-SBx3161 System Power Supplies and two AT-SBx3165 PoE Power Supplies. The AT-SBx3112 Chassis comes with three blank power supply panels in chassis slots A, B, and C as displayed in Figure 33. Slot D is left open for the installation of the first AT-SBx3161 System Power Supply. Keep the blank power supply panels in place on the unused slots to insure proper chassis airflow.

AT-SBx3165 PoE Power Supply Slots   **AT-SBx3161 System Power Supply Slots**

A   B   C   D
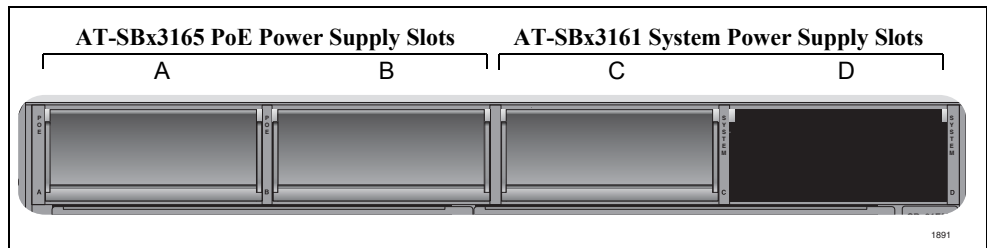
Figure 33. Slots A to D for System and PoE Power Supplies

To install the AT-SBx3161 power supply, perform the following procedure:

1. Choose a slot in the chassis for the AT-SBx3161 System Power Supply. You can install the system power supply in either slot C or D. If this is the initial installation of the chassis, Allied Telesis recommends slot D because it does not have a blank power supply panel installed.

2. If you want to install the power supply in slot C, remove the blank power supply panel by lifting the blank panel handle and lifting the panel out of the slot.

   Note

   If you are installing one power supply and choose slot C, then install the blank power supply panel that came from slot C and install it in slot D to insure proper chassis airflow. Close the handle to secure it in to the chassis.

   Warning

   The AT-SBx3161 System Power Supply contains active electronic devices, which can be damaged by electro-static discharges (ESD). Follow the procedure given in "Protection Against Electrostatic Discharge (ESD)" on page 60 to guard against ESD damage when unpacking and installing these power supplies.

3. Remove the power supply from the shipping package.

> **Note**
> Store the packaging material in a safe location. You must use the original shipping material if you need to return the unit to Allied Telesis.

4. Ensure that the following hardware components are included in your package:

    –   One AT-SBx3161 System Power Supply
    –   One AC power cord

    If one of these items is missing or damaged, contact your Allied Telesis sales representative for assistance.

5. Move the locking handle on the AT-SBx3161 to the unlocked or up position. See Figure 34

Figure 34. Unlocked Handle on the AT-SBx3161 System Power Supply

6. Align and insert the AT-SBx3161 power supply into the slot you have chosen. Figure 35 on page 63 shows the power supply installed in slot D.

⚠ **Caution**

The AT-SBx3161 System Power Supply is designed to be installed in either slot C or slot D only. If you inadvertently install this power supply in slot A or B, it will not function due to an electronic key that does not allow the power supply to turn on when installed in these slots.

Figure 35. Inserting the AT-SBx3161 System Power Supply

7. Move the power supply locking handle to the locked or down position to secure the power supply in the chassis.
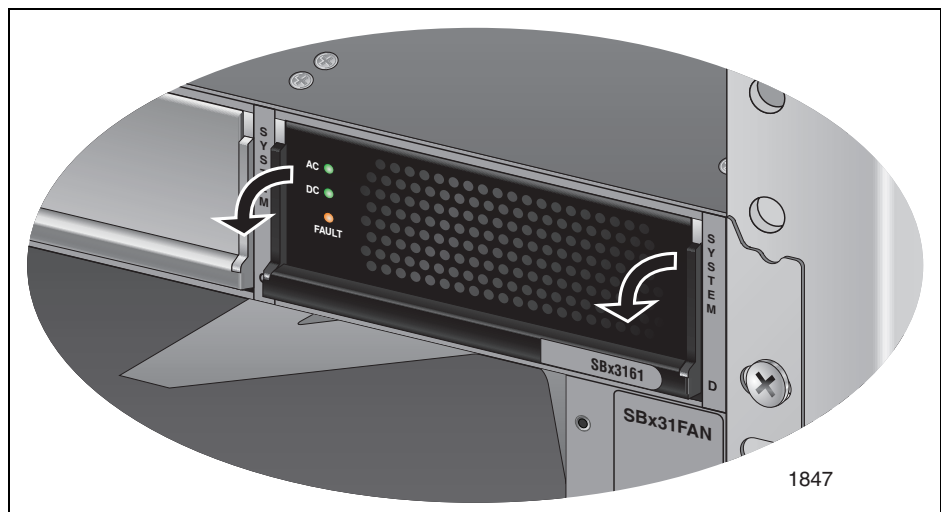
Figure 36. Lock the Handle on the AT-SBx3161 System Power Supply

8. If you have a second (redundant) AT-SBx3161 System Power Supply to install and the first power supply is installed in slot D, remove the blank power supply panel by lifting the blank panel handle and lifting the panel out of the slot C. If the first power supply is already installed in slot C, skip this step.

9. Install the second AT-SBx3161 System Power Supply into slot C or D, whichever is open, by repeating steps 3 through 7.

   The next step is to install the AT-SBx3165 PoE Power Supply(s).

Installing the AT-SBx3165 PoE Power Supply

To install the AT-SBx3165 PoE Power Supply, perform the following procedure:

1. Choose a slot in the chassis for the AT-SBx3165 PoE Power Supply. You can install the power supply in either slot A or B.

2. If you want to install the power supply in slot A, remove the blank power supply panel by lifting the blank panel handle and lifting the panel out of the slot.

> **Warning**
> The AT-SBx3165 PoE Power Supply contains active electronic devices, which can be damaged by electro-static discharges (ESD). Follow the procedure given in "Protection Against Electrostatic Discharge (ESD)" on page 60 to guard against ESD damage when unpacking and installing these power supplies.

3. Remove the power supply from the shipping package.

> **Note**
> Store the packaging material in a safe location. You may use the original shipping material if you need to return the unit to Allied Telesis.

4. Ensure that the following hardware components are included in your package:

   – One AT-SBx3165 PoE Power Supply
   – One AC power cord

   If one of these items is missing or damaged, contact your Allied Telesis sales representative for assistance.

5. Move the locking handle on the AT-SBx3165 to the unlocked or up position. See Figure 37 on page 66.
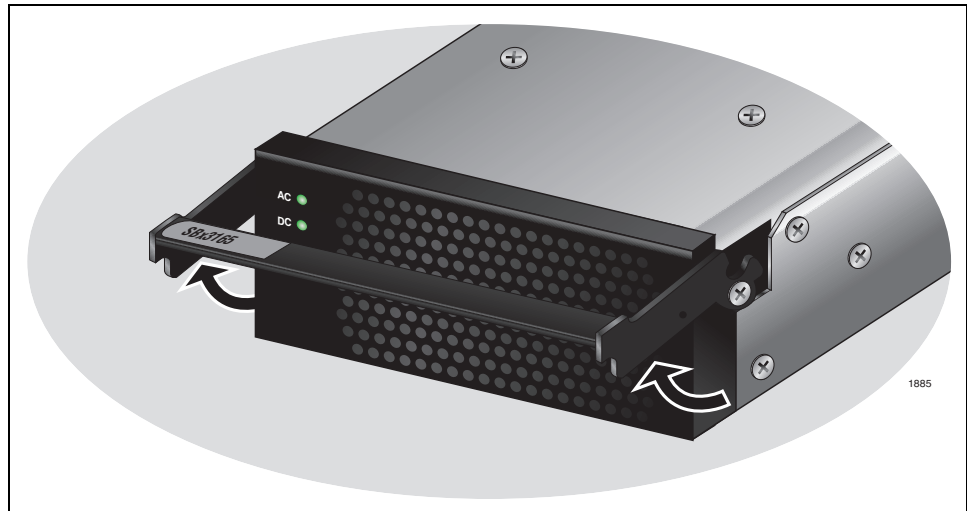
Figure 37. Unlock the Handle on the AT-SBx3165 PoE Power Supply

6. Align and insert the AT-SBx3165 in slot A. See Figure 38.

⚠ **Caution**

The AT-SBx3165 PoE Power Supply is designed to be installed in either slot A or B only. If you inadvertently install this power supply in slot C or D, it will not function due to an electronic key that does not allow the power supply to turn on when installed in these slots.
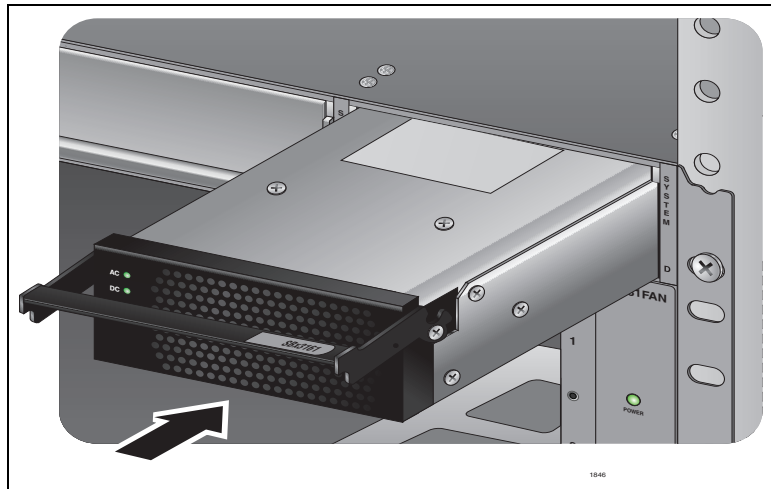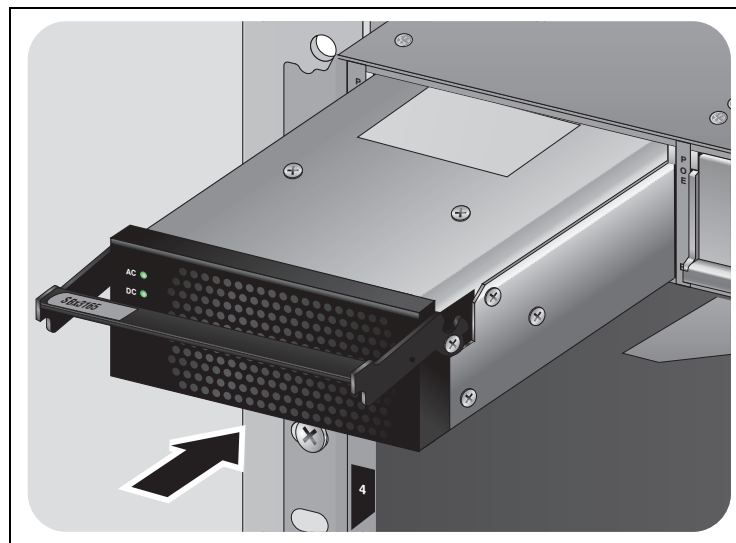

Figure 38. Inserting the AT-SBx3165 PoE Power Supply

7. Move the locking handle of the power supply to the locked or down position as displayed in Figure 39.
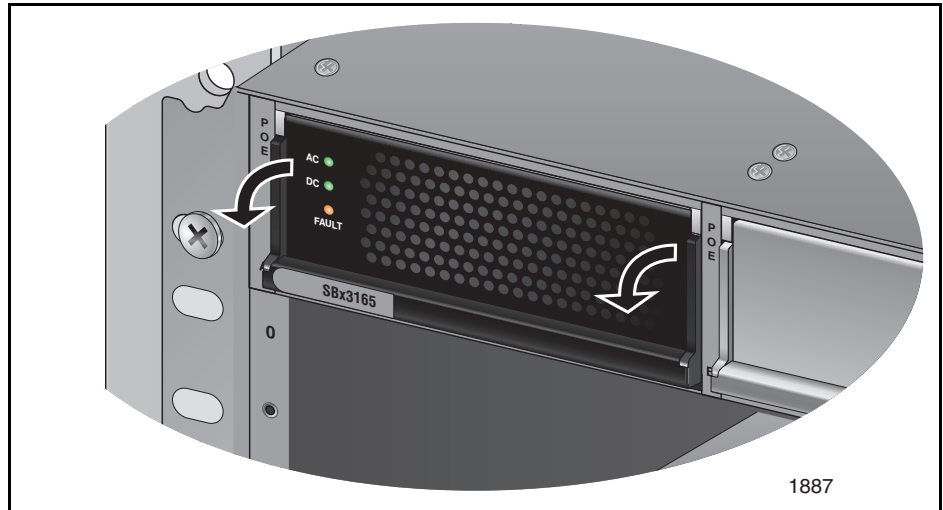
Figure 39. Locking the Handle on the AT-SBx3165 PoE Power Supply

8. If you are installing a second AT-SBx3165 PoE Power Supply, remove the Blank Panel from slot B (see Figure 33 on page 61) and store it in a secure place.

9. Install the second AT-SBx3161 System Power Supply into slot B by repeating steps 3 through 7.

   The next step in the installation is to install the AT-SBx31CFC Fabric Control Card(s) and the other Ethernet line cards.

Installing the AT-SBx31CFC Fabric Control Card

Perform the following procedure to install the AT-SBx31CFC Card:

⚠️ **Caution**
The AT-SBx31CFC Card contains active electronic devices, which can be damaged by electro-static discharges (ESD). Follow the procedure given in "Protection Against Electrostatic Discharge (ESD)" on page 60 to guard against ESD damage when unpacking and installing this card.

1. Choose a slot in the chassis for the AT-SBx31CFC Fabric Control Card. It can be installed in either slot 4 or 5.

2. Remove all components from the shipping package.

   Note
   Store the packaging material in a safe location. You may use the original shipping material if you need to return the unit to Allied Telesis.

3. Ensure that the following components are included in your package.

   – One AT-SBx31CFC Management Fabric Card

   – One RJ45 to DB9 management cable

   If either item is missing or damaged, contact your Allied Telesis sales representative for assistance.

4. Move the locking handles on the front panel to the open position as shown in Figure 40.
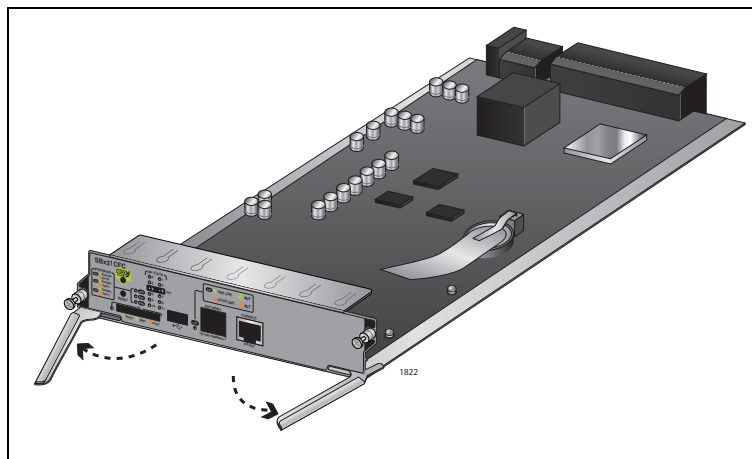
Figure 40. Opening the Locking Handles of the AT-SBx31CFC Fabric Control Card

5. Remove the battery insulator between the battery and the battery clip by pulling out the insulator tab as shown in Figure 41.
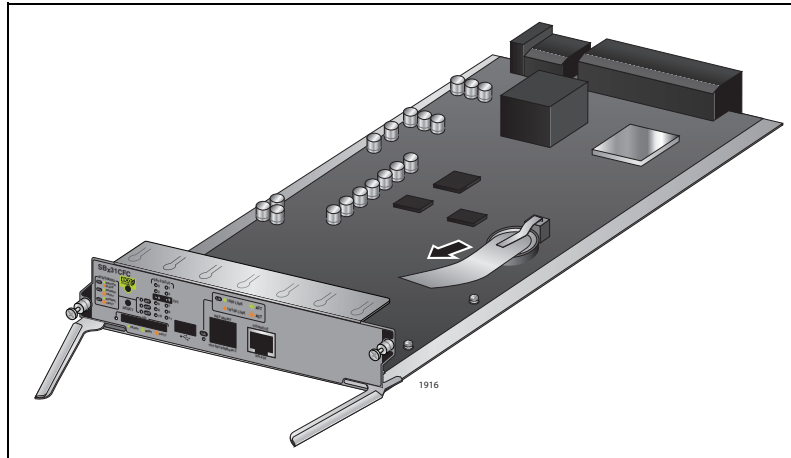
Figure 41. Removing the Battery Insulator

6. Align the AT-SBx31CFC Management Fabric Card with the internal chassis card guides in the selected slot of the AT-SBx3112 Chassis. Figure 42 shows the AT-SBx31CFC Card being aligned in slot 4.
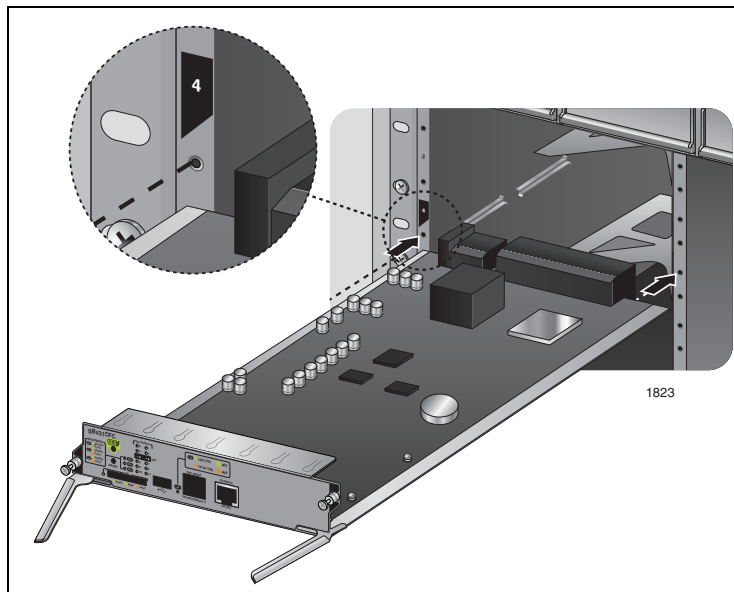
Figure 42. Aligning the AT-SBx31CFC Card in the Chassis Slot

7. Insert the card into the slot until you feel it make contact with the connector on the chassis backplane as displayed in Figure 43.

⚠️ **Caution**

Forcing the AT-SBx31CFC Card into its chassis slot when it is not properly aligned with the card guides may damage the backplane connector pins inside the chassis. If there is undue resistance, remove the card. Check to be sure that it is properly aligned with the card guides when sliding it into the chassis.

Figure 43. Inserting the AT-SBx31CFC Card in the Chassis Slot

8. Use the two locking levers on either side of the front panel to tightly seat the card into the backplane connector and secure the faceplate against the chassis front panel as displayed in Figure 44 on page 70.
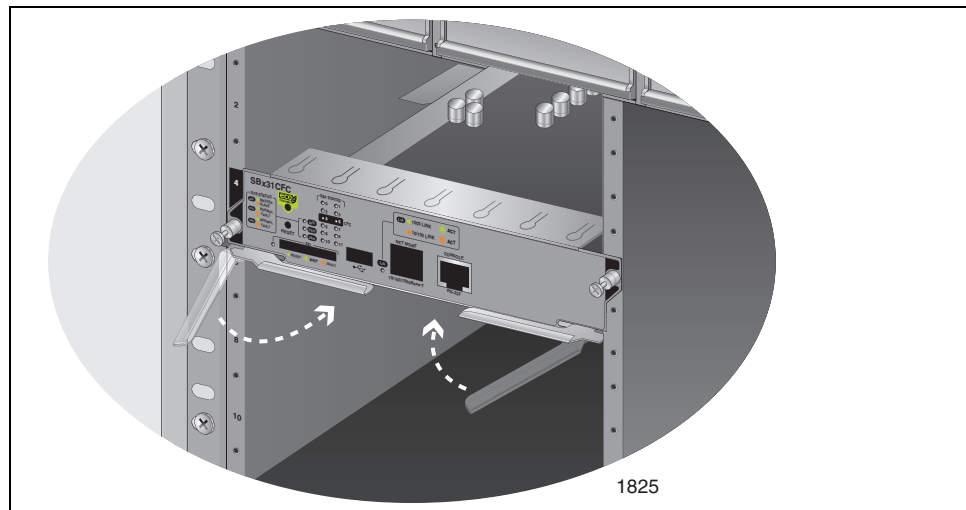
Figure 44. Closing the Locking Lever on the AT-SBx31CFC Fabric Control Card

9. Finger tighten the two thumbscrews on each side of the card as displayed in Figure 45 to attach it to the front mounting rails of the chassis.
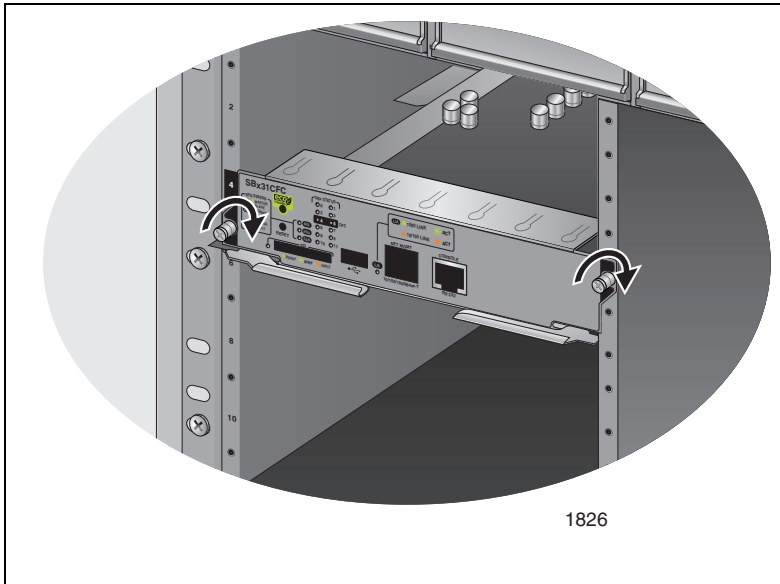
Figure 45. Tightening Thumb Screws on the AT-SBx31CFC Card

10. With a # 2 Phillips head screw driver, torque both thumbscrews to .56 Nm (5 lb-in) maximum.

11. Repeat steps 2 to 9, if you have a second AT-SBx31CFC Fabric Control Card to install.

12. For installation of the Ethernet cable to the NET MGMT port, refer to the guidelines in "Cabling the Twisted-Pair or Fiber Optic Ports" on page 82.

Installing the AT-SBx31GP24 PoE Line Card

Perform the following procedure to install the AT-SBx31GP24 PoE Line Card:

⚠️ **Caution**

The AT-SBx31GP24 PoE Line Card contains active electronic devices, which can be damaged by electro-static discharges (ESD). Follow the procedure given in "Protection Against Electrostatic Discharge (ESD)" on page 60 to guard against ESD damage when unpacking and installing this line card.

1. Choose a slot in the chassis for the AT-SBx31GP24 PoE Line Card. It can be installed in slots 0 to 3 or 6 to11.

   Note

   Chassis slots 4 and 5 are reserved for the AT-SBx31CFC Fabric Control Card.

2. Remove the line card from the shipping package. If it is missing or damaged, contact your Allied Telesis sales representative for assistance.

   Note

   Store the packaging material in a safe location. You may use the original shipping material if you need to return the unit to Allied Telesis.

3. Align the line card with the internal chassis card guides in the selected slot of the AT-SBx3112 Chassis. Figure 46 shows the line card aligned with slot 0.
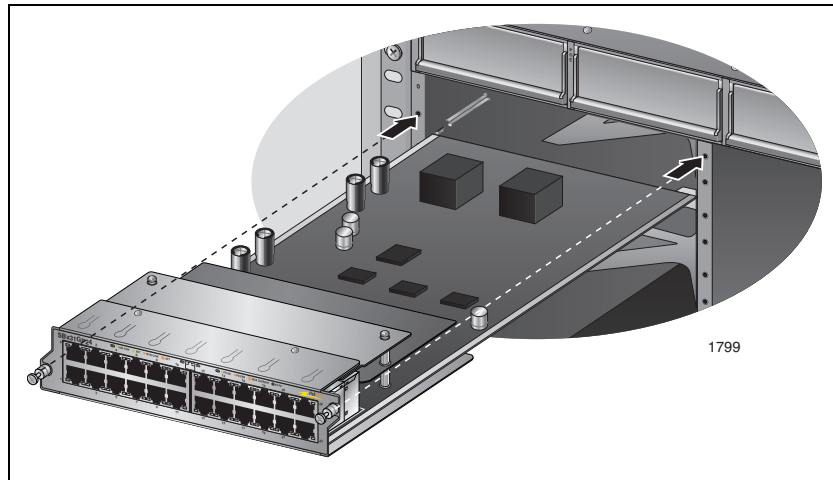
Figure 46. Aligning the AT-SBx31GP24 PoE Line Card in the Chassis Slot

4. Insert the line card into the slot as displayed in Figure 47 on page 74 until the faceplate is firmly seated against the chassis front panel.

⚠ **Caution**
Forcing the line card into its chassis slot when it is not properly aligned with the card guides may damage the backplane connector pins inside the chassis. If there is undue resistance, remove the line card. Check to be sure that it is properly aligned with the card guides when sliding it into the chassis.
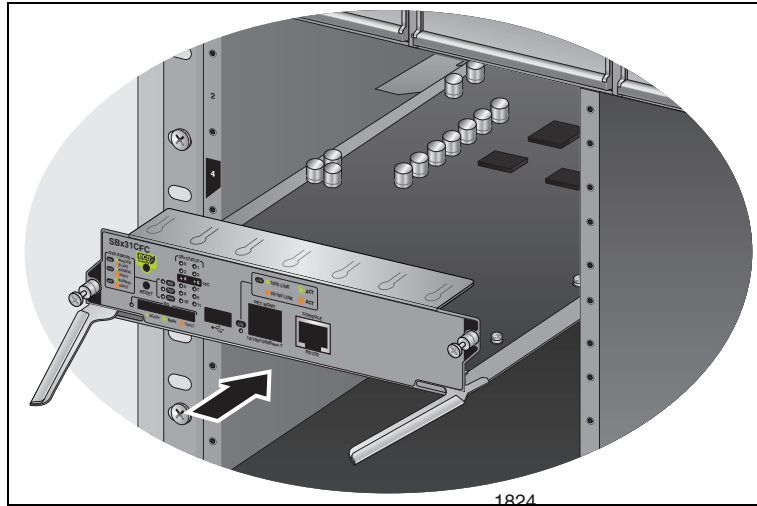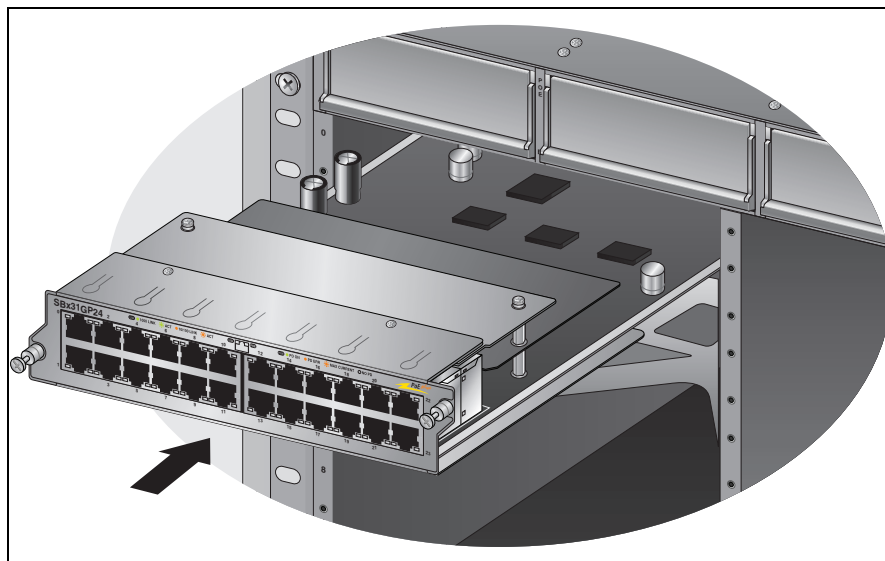
Figure 47. Inserting the AT-SBx31GP24 PoE Line Card

5. Finger tighten the two thumbscrews on each side of the line card as displayed in Figure 48 to attach it to the front mounting rails of the chassis.
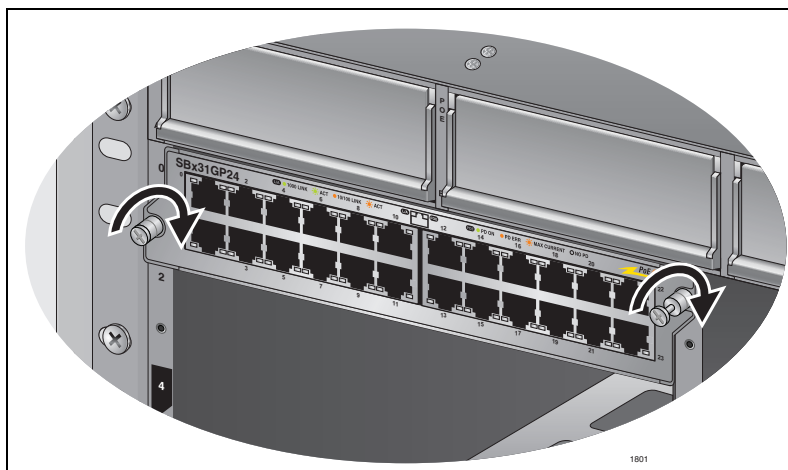
Figure 48. Tightening Thumb Screws on the AT-SBx31GP24 Line Card

6. With a # 2 Phillips head screw driver, torque both thumbscrews to .56 Nm (5 lb-in) maximum.

7. Repeat steps 2 to 6, if you have additional AT-SBx31GP24 PoE Line Cards to install.

8. For installation of the cables into the Ethernet ports, refer to the guidelines in "Cabling the Twisted-Pair or Fiber Optic Ports" on page 82.

Installing the AT-SBx31XZ4 XFP Line Card

Perform the following procedure to install the AT-SBx31XZ4 Line Card:

⚠️ **Caution**

The AT-SBx31XZ4 XFP Line Card contains active electronic devices, which can be damaged by electro-static discharges (ESD). Follow the procedure given in "Protection Against Electrostatic Discharge (ESD)" on page 60 to guard against ESD damage when unpacking and installing this line card.

1. Choose a slot in the chassis for the AT-SBx31XZ4 Line Card. The line card can be installed in slots 0 to 3 or 6 to11.

   Note

   Chassis slots 4 and 5 are reserved for the AT-SBx31CFC Fabric Control Card.

2. Remove the line card from the shipping package. If this item is missing or damaged, contact your Allied Telesis sales representative for assistance.

   Note

   Store the packaging material in a safe location. You may use the original shipping material if you need to return the unit to Allied Telesis.

3. Align the AT-SBx31XZ4 with the internal chassis card guides in the selected slot of the AT-SBx3112 Chassis. Figure 46 on page 73 shows the line card being aligned in slot 4. Figure 49 shows the line card being aligned with slot 7.
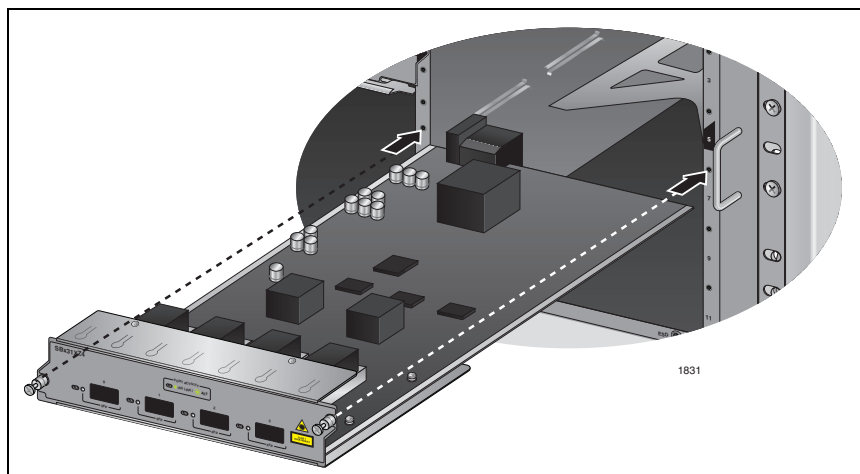
Figure 49. Aligning the AT-SBx31XZ4 XFP Line Card in the Chassis Slot

4. Insert the line card into the slot as displayed in Figure 50 until the faceplate is firmly seated against the chassis front panel.

⚠ **Caution**

Forcing the line card into its chassis slot when it is not properly aligned with the card guides may damage the backplane connector pins inside the chassis. If there is undue resistance, remove the line card. Check to be sure that it is properly aligned with the card guides when sliding it into the chassis.
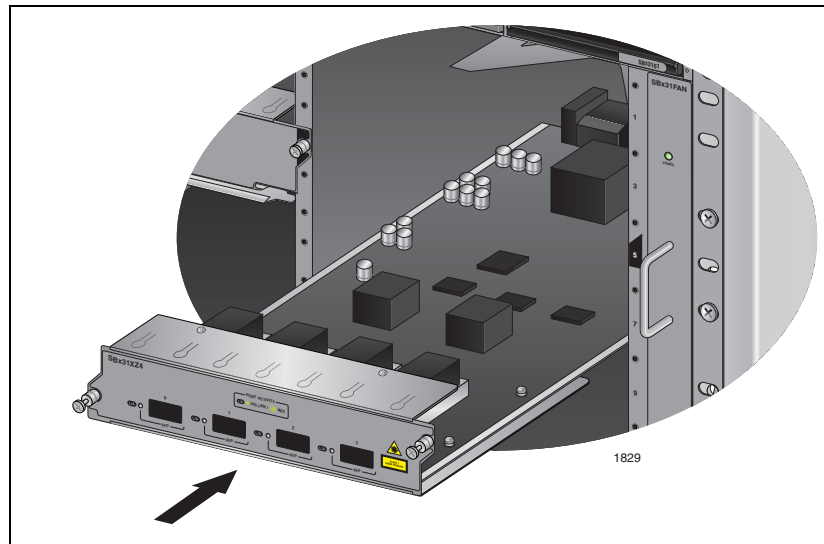
Figure 50. Installing the AT-SBx31XZ4 XFP Line Card

5. Finger tighten the two thumbscrews on each side of the line card as displayed in Figure 51 to attach it to the chassis.
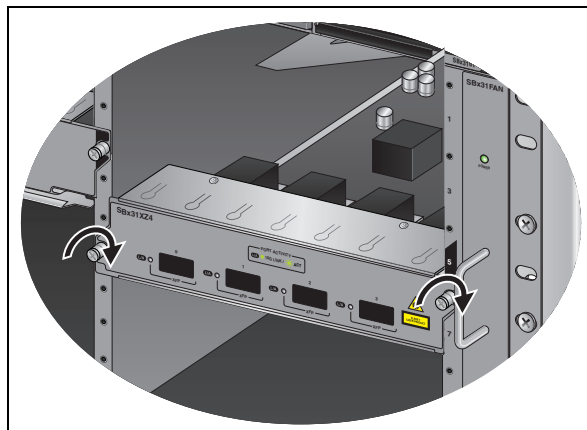
Figure 51. Tightening Thumb Screws on the AT-SBx31XZ4 XFP Line Card

6. With a # 2 Phillips head screw driver, torque both thumbscrews to .56 Nm (5 lb-in) maximum.

7. Repeat steps 2 to 6, if you have additional AT-SBx31XZ4 XFP Line Cards to install.

    The next step in the installation is "Installing an XFP Transceiver" on page 78.

Installing an XFP Transceiver

To install an XFP transceiver in the AT-SBx31XZ4 Line Card, perform the following procedure:

1. Remove the dust plug from a transceiver slot on the switch. Refer to Figure 52.
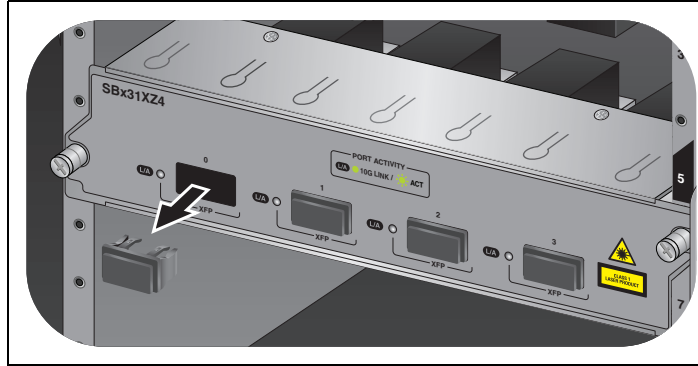
Figure 52. Removing an XFP Dust Plug

2. Remove the transceiver from its shipping container and store the packaging material in a safe location.

3. Position the transceiver with the label facing down.

4. Slide the transceiver into the slot until it clicks into place, as shown in Figure 53.
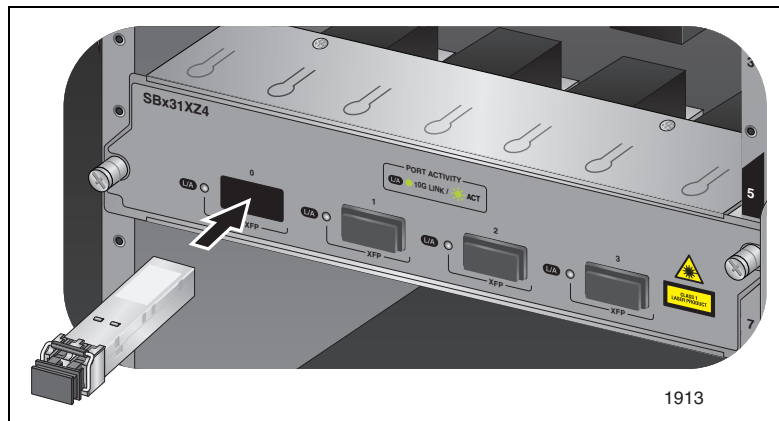
Figure 53. Installing an XFP Transceiver

5. Repeat this procedure to install other XFP transceivers.

6. Go to "Cabling the Twisted-Pair or Fiber Optic Ports" on page 82 for installation cabling guidelines in the XFP transceiver ports.

   For XFP optical and cabling specifications, consult the XFP module data sheet available at www.alliedtelesis.com. Refer to "Where to Find Web-based Guides" on page 13 for information about how to navigate to this information.

Replacing the AT-SBx31FAN Tray

The AT-SBx31FAN Tray can only be replaced in the vertical chassis slot located on the right side of the AT-SBx3112 Chassis.

Note
Before replacing the fan, it is recommended that you disable the AT-SBx31FAN Tray in the Switchblade x3112 Management Software This will stop the fan alarms from being sent to network administrators during the replacement period.

Perform the following procedure to replace the AT-SBx31FAN Tray:

⚠ **Caution**
The AT-SBx31FAN Tray contains active electronic devices, which can be damaged by electro-static discharges (ESD). Follow the procedure given in "Protection Against Electrostatic Discharge (ESD)" on page 60 to guard against ESD damage when unpacking and installing this line card.

1. Remove the AT-SBx31FAN Tray from the shipping package.If this item is missing or damaged, contact your Allied Telesis sales representative for assistance.

    Note
    Store the packaging material in a safe location. You may use the original shipping material if you need to return the unit to Allied Telesis

2. Insert the AT-SBx31FAN Tray into the vertical slot on the right side of the chassis into the slot as displayed in Figure 54 until it is firmly seated against the front mounting rails of the chassis.
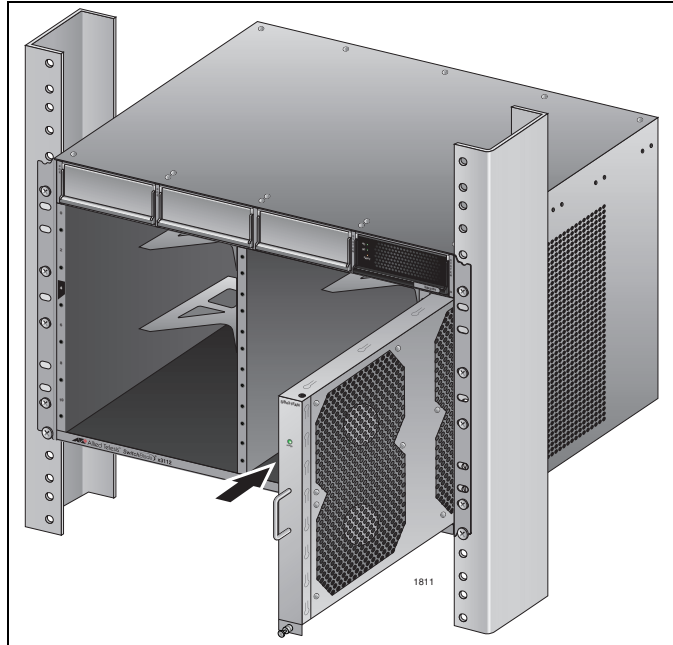
Figure 54. Inserting the AT-SBx31FAN Tray into the Chassis

3. Finger tighten the thumbscrew on the bottom of the AT-SBx31FAN Tray as displayed in Figure 55 to attach it to the chassis.

Figure 55. Tightening the AT-SBx31FAN Tray Thumb Screw

4. With a # 2 Phillips head screw driver, torque the thumbscrew to .56 Nm (5 lb-in) maximum.

Cabling the Twisted-Pair or Fiber Optic Ports

Observe the following guidelines when connecting a twisted-pair or fiber optic cable to a port on the switch:

❐ The connector on the cable should fit snugly into the port on the switch. The tab on the connector should lock the connector into place.

❐ Because the twisted-pair ports on the switch are auto-MDI/MDI-X, any type of network device can be connected to a port on the switch using a straight-through twisted-pair cable. If you disable Auto-Negotiation on the port, the port defaults to MDI-X. For instructions on how to configure a port, refer to the Software Reference for SwitchBlade® x3100 Series Switches on the ATI web site for specific information. Go to "Where to Find Web-based Guides" on page 13 for information about how to navigate to this document.

❐ If your network topology contains a loop where two or more network devices can communicate with each other over more than one network path, do not connect the network cables forming the loop until after you have activated a spanning tree protocol on the switch. Data loops can adversely affect network performance.

❐ If you are creating a port trunk, you must configure the Switchblade x3112 Management Software before connecting the cables of the trunk to the switch. Otherwise, a network loop will result which can adversely affect network performance.

❐ In order for a switch port to successfully Auto-Negotiate its duplex mode with an end node, the end node should also be using Auto-Negotiation. Otherwise, a duplex mode mismatch can occur. A switch port using Auto-Negotiation defaults to half-duplex if it detects that the end node is not using Auto-Negotiation. This can result in a mismatch if the end node is operating at a fixed duplex mode of full-duplex.

To avoid this problem, disable Auto-Negotiation on a switch port and set the port's speed and duplex mode manually if the end node has a fixed duplex mode of full-duplex.

Installing the Chassis Blank Panels

Ten blank panels are supplied with the AT-SBx3112 Chassis. These panels must be installed in to insure proper airflow through out the chassis. To install the blank panels, perform the following procedure:

1. Install a blank panel in each vacant slot from slots 0 to 11 where a line card has not been installed.

2. Align the two thumb screws on the blank panel with the mounting holes on the front panel rails of the chassis.

3. Finger tighten the two thumbscrews to attach the blank panel to the chassis.

4. With a # 2 Phillips head screw driver, torque both thumbscrews to .56 Nm (5 lb-in) maximum.

5. Repeat steps 2 through 4 for the remaining vacant slots.

6. Store any unused blank panels in a secure place for future use.

Applying A/C Power to the SwitchBlade x3112

If you have not already installed the power supply(s), go to the "Installing the AT-SBx3161 System Power Supply" on page 61 and "Installing the AT-SBx3165 PoE Power Supply" on page 65.

1. Locate the AC sockets on the back of the AT-SBx3112 Chassis as displayed in Figure 56. The sockets are labeled A to D. They correspond to the power supply slots on the front panel.
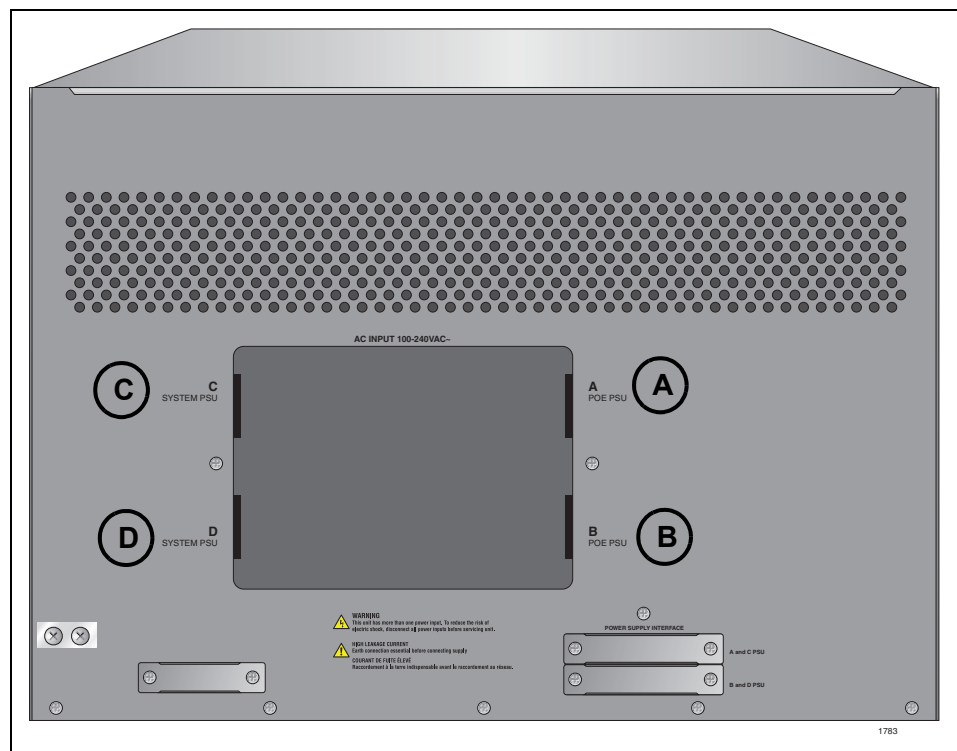
Figure 56. AC Sockets on the AT-SBx3112 Chassis Rear Panel

2. Locate the AC power cord shipped with the power supply(s).

3. Connect the AC power cord to the appropriate AC socket on the chassis rear panel.
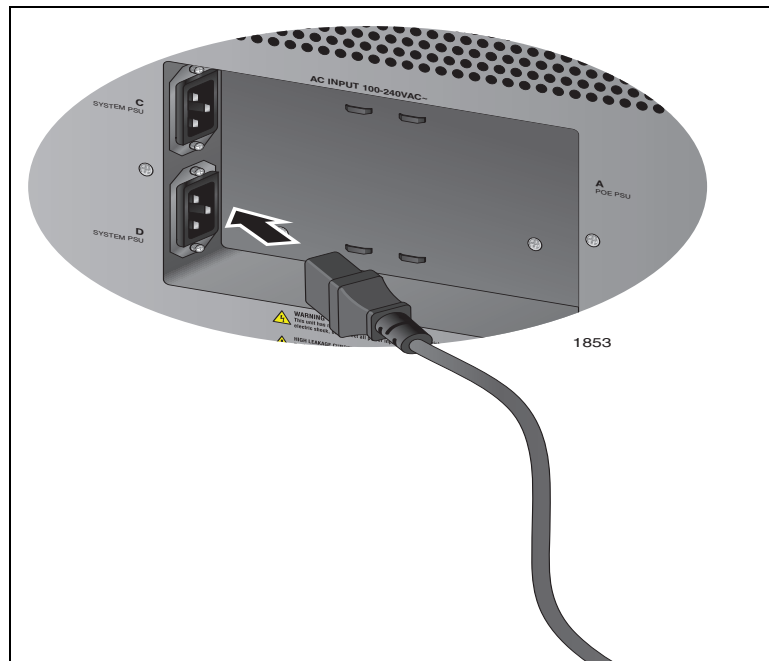
Figure 57. Connecting AC Power Cord in rear of AT-SBx3112 Chassis

4. Verify that the socket-outlet from which the equipment is to be powered provides a connection to the building protective earth.

5. Connect the power cord to an appropriate AC power source. This energizes the power supply.

6. Verify that the power supply POWER LED is green.

   If the LED is OFF, refer to Table 10 on page 39 or Table 11 on page 41 for a description of the LED status.

7. Repeat the procedure for all the power supplies in the chassis.

   The switch is now powered on and ready for network operations. To start a local management session on the switch, refer to "Starting a Local Management Session" on page 87.

Starting a Local Management Session

The procedure in this section explains how to start a local (out-of-band) management session using the RJ-45 terminal port on the AT-SBx31CFC Management Fabric Card. You can use a local management session to configure the switch's operating parameters and view performance and error statistics.

To start a local management session, perform the following procedure:

1. Connect the RJ-45 end of to the Console RS-232 Port on the front panel of the AT-SBx31CFC Fabric Control Card, as displayed in Figure 58.
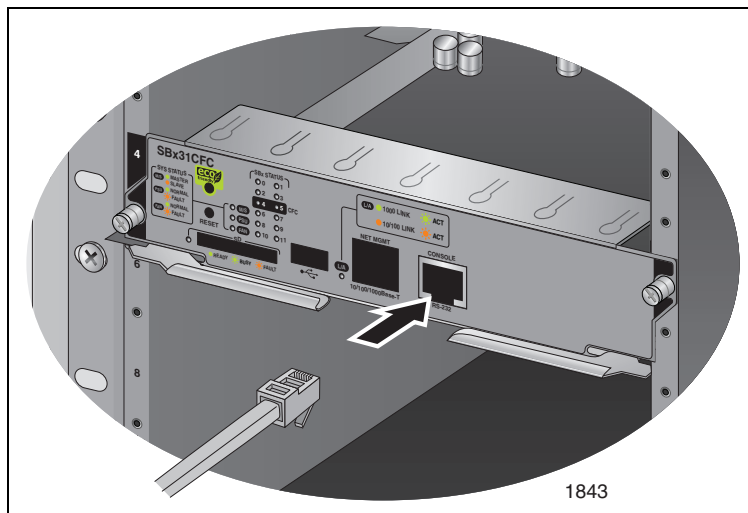
Figure 58. Connecting the Management Cable to the Console RS-232 Port

Note
The management cable included with the AT-SBx31CFC Fabric Control Card**.**

Connect the other end of the cable to an RS-232 port on a terminal or a personal computer with a terminal emulation program.

2. Configure the terminal or terminal emulation program as follows:

   ❒ Baud rate: Default is 115,000 bps (Range is 9600 to 115200 bps)
   ❒ Data bits: 8
   ❒ Parity: None
   ❒ Stop bits: 1
   ❒ Flow control: None

> **Note**
> The port settings are for a DEC VT100 or ANSI terminal, or an equivalent terminal emulator program.

3. Press Enter.

   You are prompted for a user name and password.

4. To configure the switch settings, enter the default user name and password. They are "manager" / "friend" (without the quotes.)

   User names and passwords are case sensitive.

5. The local management session starts and the command line interface (CLI) prompt is displayed.

   For information about the command line interface, refer to the Software Reference for SwitchBlade® x3100 Series Switches on the Allied Telesis web site. Go to "Where to Find Web-based Guides" on page 13 for information about how to navigate to this document.

Chapter 3

Troubleshooting

This chapter contains information about how to troubleshoot the SwitchBlade x3112 in the event that a problem occurs.

> **Note**
> If after following the instructions in this chapter you are unable to resolve the problem, contact Allied Telesis Technical Support for further assistance. Refer to "Contacting Allied Telesis" on page 14 for contact information.

The following troubleshooting information is available:

❒ "PSU Fault LED Flashing Amber on AT-SBx31CFC Fabric Control Card" on page 90

❒ "FAN Fault LED Flashing Amber on AT-SBx31CFC Fabric Control Card" on page 91

❒ "SBx Status LEDs Flashing Amber on AT-SBx31CFC Fabric Control Card" on page 92

❒ "Link LED is Off on AT-SBx31GP24 PoE Line Card" on page 93

❒ "PoE Device is not Receiving Power on AT-SBx31GP24 PoE Line Card" on page 94

❒ "Port LED is Off on AT-SBx31XZ4 XFP Line Card" on page 95

❒ "Cannot Establish a Local (Out-of-Band) Management Session" on page 97

PSU Fault LED Flashing Amber on AT-SBx31CFC Fabric Control Card

Check the PSU System Status LED on the front of the AT-SBx31CFC card for a solid green or flashing amber status. A flashing amber status LED indicates a FAULT condition on one or more power supplies.

Check each Fault LED on each AT-SBx3161 System Power Supply and AT-SBx3165 PoE Power Supply to see which one(s) is solid amber and then do the following:

❐ You can obtain the current status for each power supply by using the Switchblade x3112 Management Software by entering the following commands:

```
officer SEC>> SHOW PSU

officer SEC>> SHOW PSU FULL
```

Contact Allied Telesis Technical Support for further assistance. Please report the power supply fault condition and the information obtained from the SHOW PSU and SHOW PSU FULL commands.

❐ If the affected power supply needs to be replaced, remove it and install a replacement power supply. Refer to "Installing the AT-SBx3161 System Power Supply" on page 61.

Note
The AT-SBx3161 System Power Supply and AT-SBx3165 PoE Power Supply are hot swappable when used in a redunant configuration. This allows the SwitchBlade x3112 to continue to operate while you exchange power supplies.

FAN Fault LED Flashing Amber on AT-SBx31CFC Fabric Control Card

Check the FAN System LED on the front panel of the AT-SBx31CFC Fabric Control Card for a solid green or flashing amber status. A flashing amber status LED indicates a FAULT condition in the AT-SBx31FAN Tray.

The fan tray is initialized by the software running on the AT-SBx31CFC Fabric Control Card. The fan speed is independently adjusted proportional to the internal operating temperature. If the fan speed of one or more fans falls below a set minimum speed, the fan FAULT condition will occur.

You can obtain specific information for the AT-SBx31CFC Fabric Control Card by using the Switchblade x3112 Management Software to note specific parameters by entering the following command:

```
officer SEC>> SHOW FANMODULE
```

❒ Contact Allied Telesis Technical Support for further assistance. Please report the AT-SBx31FAN Tray fault condition and the information obtained from the SHOW FANMODULE command.

❒ If the AT-SBx31FAN Tray needs to be replaced, remove the assembly and install a replacement AT-SBx31FAN Tray. Refer to "Replacing the AT-SBx31FAN Tray" on page 79.

> **Note**
> The AT-SBx31FAN Tray is hot swappable which allows the SwitchBlade x3112 to continue to operate while you exchange AT-SBx31FAN Trays.

SBx Status LEDs Flashing Amber on AT-SBx31CFC Fabric Control Card

If a SBx Status LED is flashing amber, the line card has experienced a FAULT or an error condition. See "SBx STATUS LED Description on the Active AT-SBx31CFC Fabric Control Card" on page 23 for an explanation of all status conditions.

> **Note**
> All line cards are hot swappable. This allows the AC power to be connected to the SwitchBlade x3112 while you re-seat or exchange line cards.

❑ If a FAULT condition is encountered for one of the card slots, you can attempt to restart the line card. The following example is for restarting a card in slot 2:

```
officer SEC>> restart card 2

You will be prompted as follows – enter y for YES:

Do you really want to restart card 2 (Y/N)? y

Command has been submitted

officer SEC>>
```

❑ If the RESTART CARD command is not successful, remove the line card from the slot and re-seat until the face plate is flush with the chassis front panel. Wait for 2 to 3 minutes for it to come on line. If it successfully comes up, the SBx Status LED for the slot in question turns to solid green.

❑ You can obtain specific card status information for each card slot through the Switchblade x3112 Management Software by entering the SHOW CARD command as follows:

```
officer SEC>> show card
```

❑ If the SBx Status LED for the slot is continues to flash amber after the above actions have been taken, contact Allied Telesis for further assistance. Please report the slot where the SBx Status LED fault condition is present and the information obtained from the SHOW CARD command.

Link LED is Off on AT-SBx31GP24 PoE Line Card

Under normal operating conditions for a port with an active LINK status, the LINK LED for each port is either solid GREEN or AMBER, or it is flashing GREEN or AMBER. Refer to "Port LEDs on the AT-SBx31GP24 PoE Line Card" on page 32 for the LINK LED location and Table 7 on page 32 for the LINK LED description. If a Link LED is off, do the following:

❒ Verify that the end node connected to the port is powered ON and is operating properly.

❒ Check that the twisted-pair cable is securely connected to the port on the switch and to the port on the end node.

❒ Make sure that the twisted-pair cable does not exceed 100 m (328 ft).

❒ Verify that you are using the appropriate category of twisted-pair cable: Category 3 or better for 10 Mbps operation, Category 5/5E for 100 Mbps 1000 Mbps and Category 6/6E for 10GBASE-T operations.

❒ Determine if a crossover cable is required. Since the twisted-pair ports feature auto MDI/MDI-X, you should be able to use a straight-through cable regardless of the type of device you connect to a port. However, if you disable auto-negotiation on a port and set a port's speed and duplex mode manually, the port defaults to MDI-X.

❒ Verify that the twisted-pair cable is not faulty by replacing it with a known good cable

❒ Make sure that the operating parameters of the port on the switch are compatible with the end node to which the port is connected. This may require that you use the Switchblade x3112 Management Software.

PoE Device is not Receiving Power on AT-SBx31GP24 PoE Line Card

If you attached a powered device (PD) to a port on a AT-SBx31GP24 card, the PoE LED for the port should be green. If the device is not receiving power or the PoE LED is flashing amber, steady amber, or is OFF, do the following:

❏ Check to be sure that the PD is designed to receive power over pins 1, 2, 3, and 6 on the RJ-45 port. This can be verified by reviewing the device's documentation or data sheet.

❏ Check that the device's power requirements do not exceed 30 W. This can be verified by reviewing the device's documentation or data sheet.

❏ Verify that the PD is not faulty

❏ Verify that you are using the appropriate category of twisted-pair cable: Category 3 or better for 10 Mbps operation, Category 5/5E for 100 Mbps 1000 Mbps and Category 6/6E for 10GBASE-T operations.

❏ Verify that the twisted-pair cable is not faulty by replacing it with a known good cable.

❏ Use the Switchblade x3112 Management Software to determine whether PoE is enabled on the port. The default setting for PoE is enabled.

❏ Use the Switchblade x3112 Management Software to determine whether the PoE power setting for the port has been reduced from the default setting of 30 W, to a value below the power requirements of the device.

❏ Verify that the power budget on the switch is not being exceeded by the number of PDs and their load requirements. This should not be a problem for the AT-SBx31GP24 card, which can support PDs on all ports 1 to 24, assuming the connected devices require no more than 30 W/port. However, if the total number of ports in the AT-SBx3112 chasssis exceeds the maximum allowed with the number of AT-SBx3165 PoE supplies, this will result in a FAULT condition for those ports over the limit. Refer to "IEEE802.3at Classes versus AT-SBx31GP24 Power Levels" on page 34 for the maximum number of ports supported for each Class.

Port LED is Off on AT-SBx31XZ4 XFP Line Card

For fiber optic uplink ports that have an XFP transceiver installed, verify that the 1000 LINK LED is ON. If a 1000 LINK LED is off but the transceiver is present, do the following:

❒ Verify that the end node connected to the port is powered ON and is operating properly.

❒ Check that the fiber optic cable is securely connected to the XFP transceiver in the AT-SBx31XZ4 XFP Line Card and to the port on the remote end node. The dual ports in an XFP transceiver consist of two separate connectors, where each connector connects to a separate fiber strand.
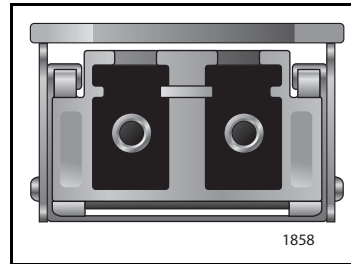
Figure 59. Dual Ports of XFP Tranceiver

When you connect a fiber optic cable, be sure that the receive fiber connector of the XFP transceiver is connected to the transmit connector on the remote end node, and that the transmit fiber connector is connected to the receive connector on the remote node.

❒ Make sure that you are using the appropriate type of fiber optic cable and that the cable length does not exceed the allowed maximum distance. For cable specifications, refer to the data sheet for your XFP transceiver.

❒ Use a fiber optic tester to test the attenuation on the cable to determine if the strength of the fiber optic signal falls below acceptable limits. For fiber optic port specifications, refer to the data sheet for your XFP transceiver.

❒ Check that the operating specifications (for instance, wavelength and maximum operating distance) of the fiber optic port on the remote end node are compatible with the fiber optic port on the AT-SBx31XZ4 XFP Line Card.

❒ Check to be sure that the fiber optic ports on theAT-SBx31XZ4 XFP Line Card and on the remote end node are operating at the same speed and duplex mode.

❒ Verify that any optional XFP transceivers are completely inserted into the SP slot on the front of the switch.

❒ Verify that the XFP transceiver is IEEE 802.3ae (10G Ethernet) and XFP MSA compliant. If an XFP transceiver meets a "Fiber Channel" standard, it may not link up.

Cannot Establish a Local (Out-of-Band) Management Session

If you are unable to establish a local (out-of-band) management session with the switch through the terminal port on the front panel, do the following:

❒ Check to be sure that the RJ-45 serial management cable is securely connected to the serial terminal port on the switch and to the RS-232 port on the terminal or personal computer.

❒ Check to be sure that the operating parameters on the terminal or the terminal emulation program, if you are using a personal computer, have been set correctly. The default settings for the RJ-45 serial terminal port are located in "Starting a Local Management Session" on page 87.

Appendix A
Technical Specifications

Physical Specifications

Dimensions AT-SBx3112 Chassis	(W x D x H): 48.03 cm x 38.79 cm x 31.01 cm (18.91 in x 15.27 in x 12.21 in)
AT-SBx3161 System Power Supply	10.16 cm x 32.21 cm x 4.34 cm (4.00 in x 12.68 in x 1.71 in)
AT-SBx3165 PoE Power Supply	10.16 cm x 32.21 cm x 4.34 cm (4.00 in x 12.68 in x 1.71 in)
AT-SBx31FAN Tray	2.74 cm x 33.35 cm x 26.04 cm (1.08 in x 13.13 in x 10.25 in)
All Cards (AT-SBx31CFC Card) (AT-SBx31XZ4 XFP Line Card) (AT-SBx31GP24 PoE Line Card)	20.67 x 31.32 cm x 40.64 cm (8.14 in x 12.33 in x 1.6 in)
Weight:	
AT-SBx3112 Chassis with 3 PSU blank panels and 10 Line Card blank panels	17.77 kg (39.10 lb)
AT-SBx3161 System Power Supply with power cord	2.75 kg (6.05 lb)
AT-SBx3165 PoE Power Supply with power cord	2.73 kg (6.00 lb
AT-SBx31FAN Tray	1.82 kg (4.00 lb)
AT-SBx31CFC Card	1.09 kg (2.40 lb)
AT-SBx31XZ4 XFP Line Card	0.82 kg (1.80 lb)
AT-SBx31GP24 PoE Line Card	1.06 kg (2.34 lb)

Environmental Specifications

Operating Temperature: -0° C to 40° C (32° F to 104° F)

Storage Temperature: -25° C to 70° C (-13° F to 158° F)

Operating Humidity: 5% to 90% non-condensing

Storage Humidity: 5% to 95% non-condensing

Operating Altitude Range: Up to 3,000 m (9,843 ft)

Power Specifications

AC Voltage/Frequency Requirements: 100 - 240 VAC, 50/60 Hz

AC Input Current:
  AT-SBx3161 System Power Supply   16 A Maximum

  AT-SBx3165 PoE Power Supply   16 A Maximum

Available Power over Ethernet:

One PoE Power Supply Installed   1200 W @ 56 VDC
     IEEE 802.3at Class 4 (30 W /port):   40 ports Maximum
     IEEE 802.3af Class 3 (15.4 W /port):   77 ports Maximum
     IEEE 802.3af Class 2 (7.3 W /port):   171 ports Maximum
     IEEE 802.3af Class 1 (4.0 W /port):   240 ports Maximum

Two PoE Power Supplies Installed   2400 W @ 56 VDC
     IEEE 802.3at Class 4 (30 W /port):   80 ports Maximum
     IEEE 802.3af Class 3 (15.4 W /port):   155 ports Maximum
     IEEE 802.3af Class 2 (7.3 W /port):   240 ports Maximum
     IEEE 802.3af Class 1 (4.0 W /port):   240 ports Maximum

IEEE 802.3af Mode: Alternative A (MDI)
IEEE 802.3at Mode: Alternative A (MDI)

Safety and Electromagnetic Emissions Certifications

EMI/RFI: FCC Class A, EN55022 Class A, CISPR Class A

Immunity: EN55024

Electrical Safety: EN60950-1 (TUV), UL60950-1 ($_c$UL$_{us}$), EN60825

Safety Agency Approvals: $_c$UL$_{us}$, TUV, C-TICK, CE

Quality and Reliability - MTBF @ 30°C:

AT-SBx3112 Chassis	260,000 Hours
AT-SBx3161 System Power Supply	460,000 Hours
AT-SBx3165 PoE Power Supply	460,000 Hours
AT-SBx31CFC Card	310,000 Hours
AT-SBx31FAN Tray	460,000 Hours
AT-SBx31GP24 PoE Line Card	300,000 Hours
AT-SBx31XZ4 XFP Line Card	420,000 Hours

Connectors and Port Pinouts

This section lists the connectors and connector pinouts for the SwitchBlade x3112 line cards.

Figure 60 illustrates the pin layout for an RJ-45 connector and port.
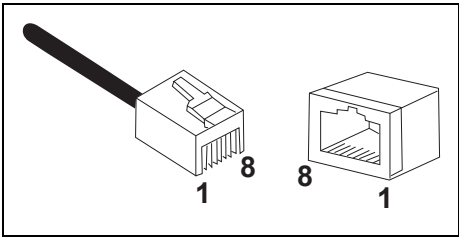

Figure 60. RJ-45 Connector and Port Pin Layout

Table 14 lists the RJ-45 pin signals when a twisted-pair port is operating in the MDI configuration.

Table 14. MDI Pin Signals (10Base-T or 100Base-TX)

Pin	Signal
1	TX+
2	TX-
3	RX+
6	RX-

Table 15 lists the RJ-45 port pin signals when a twisted-pair port is operating in the MDI-X configuration.

Table 15. MDI-X Pin Signals (10Base-T or 100Base-TX)

Pin	Signal
1	RX+
2	RX-
3	TX+
6	TX-

Table 16 lists the RJ-45 connector pins and their signals when a 1000Base-T port is operating at 1000 Mbps.

Table 16. RJ-45 1000Base-T Connector Pinouts

Pin	Pair	Signal
1	1	TX and RX+
2	1	TX and RX-
3	2	TX and RX+
4	3	TX and RX+
5	3	TX and RX-
6	2	TX and RX-
7	4	TX and RX+
8	4	TX and RX-

Cable Requirements

Table 17. Cable Requirements for the 10/100/1000Base-T Management Port

Speed	Cable Type	Maximum Operating Distance
10 Mbps	Standard TIA/EIA 568-B-compliant Category 3 or better shielded or unshielded cabling with 100 ohm impedance and a frequency of 16 MHz.	100 m (328 ft)
100 or 1000 Mbps	Standard TIA/EIA 568-B-compliant Enhanced Category 5 (Cat 5e) shielded or unshielded cabling with 100 ohm impedance and a frequency of 100 MHz.	100 m (328 ft)